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A MANUAL

OF THE

Eclectic Treatment of Disease

DESIGNED FOR THE MANY

STUDENTS AND PRACTITIONERS

*Who are now Diligently Searching for Knowledge of the Most Direct
Action of Drugs, as Applied to Specific Conditions of Disease.*

BY

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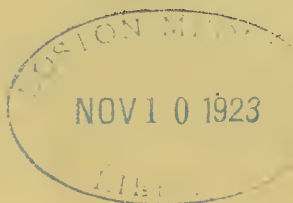
IN TWO VOLUMES.

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TO MY FOUR SONS

In recognition of their respect and confidence,
this work is affectionately dedicated

BY THE AUTHOR.



PREFACE.

Almost from the day my *Materia Medica*, *Therapeutics* and *Pharmacognosy* was given to the profession, I have received the most urgent requests to prepare a work on the *Practice of Medicine*, which should embody the truths which are presented in the above mentioned work. I finally concluded to present the facts fully in "The Treatment of Disease." This will be found to differ from a complete work on Practice, only in the fact that I have left the exhaustive consideration of the history, etiology and pathology of disease to other writers. The subject of etiology, however, in each disease will be found sufficiently full for all practical purposes, and the symptomatology, diagnosis and prognosis are as complete as in a work on Practice. In treatment the work is exhaustive and I trust it will be found to be as practical as the suggestions have proven to be to the author.

In the arrangement of the different topics in this work, I have reserved the right to sacrifice a strictly scientific grouping in a few instances, to my idea of a practical arrangement. To illustrate: I have grouped croupous pneumonia with lung diseases, and certain infectious intestinal diseases with diseases of the latter class, instead of grouping them solely with reference to their infectious origin. The group of exanthematous diseases includes only the major exanthemata, those of the more common acute fibrile type in which the exanthem is the conspicuous factor of the disease.

This work is designed strictly as a companion to my *Materia Medica* and *Therapeutics*, above mentioned, and I have therefore, in treatment, often given only the name of the remedy indicated, and have not fully described its mode

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of action, depending upon the reader to refer to the companion work for a full, thorough and exhaustive consideration of the remedies. If this work is received as enthusiastically as the companion work, and proves as useful as that work seems to have proven, I shall have occasion to be more than satisfied.

FINLEY ELLINGWOOD.

Evanston, Illinois, May 1, 1906.

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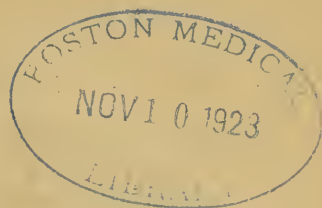
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Eclectic Treatment of Disease.

CONDITIONS OF DISEASE.

The successful treatment of disease is the final objective point of every student of medicine. It has been the sentiment of conspicuous members of the profession that, after all the research of the past, we know nothing about the curing of disease. Doubt and indecision have prevailed for centuries. But out of all the study, research and observation, especially of the past half century, positive advancement has been made. From the mass of theory, facts have been determined, truths have been developed, and exact and correct principles have been enunciated, until now we feel that we can prevent, and cure disease.

A principle, now of almost general acceptance, is that of the selective action of each remedy, upon exact disease manifestations, through its influence upon special structures, parts or organs. Conversely, by carefully studying each disease in its totality, by dissecting and analyzing it, we find exact conditions, upon each of which some remedy will act directly.

It is necessary to consider all of the phenomena of a given disease under a given head, but in the treatment of that disease we must consider every element or factor of the disease present in each given case separately, with special reference to the specific selective action of that single remedy which experience has taught us will correct that symptom or group of symptoms. Certain of these conditions, elements or factors of disease occur as pathological entities, exhibited either by one symptom only, or by a

group of nearly invariable symptoms. These may be found to occur during the progress of many diseases, and whenever occurring exercise an important influence upon the condition as a whole. We have found these conditions amenable to specific treatment, which exercises the same influence upon them, whatever the disease may be in which they are found.

Among the conditions which we have to consider in the treatment of any disease, are congestion, elevated and sub-normal temperatures, hyperemia and anemia, local or general, and especially of the brain or nerve centers; pain, nervous irritation, direct or reflex; the condition of the secretions, the condition of the tongue, the condition of the gastro-intestinal tract, excessive or deficient acidity, and sleeplessness.

I will present, very briefly, some suggestions which are applicable in the treatment of these conditions, whenever they may be found.

Congestion:—This is undoubtedly the initial, the primary pathological condition in acute inflammation. It may be caused by micro-organisms, by cold or by injury. This condition is considered in the treatment of the various diseases, as there are characteristic underlying symptoms when congestion attacks distinct organs primarily which must be considered. When the congestion threatens the brain, or the meninges the patient is dull, listless, indifferent, drowsy, the eyes are dull, the pupils dilated, and insensitive to light, the skin is cool, usually moist, and in extreme cases the extremities are cold. There may or may not be chilliness, but the general temperature is usually high, always so after the condition is well established. We have no remedy in the materia medica which is more specific in its influence than *belladonna* is to acute congestion, and less positively, to congestion of more gradual development. Whether congestion be present independently of other acute inflammation, or whether congestion or inflam-

mation be diagnosed in any other organ at the same time, this agent is of much service.

Belladonna is contra-indicated in acute cerebral hyperemia and in nervous excitement from other causes. It is a profound active physiological stimulant to the capillary circulation. Heat is a most important measure in the treatment of congestion. Intense, persistent heat is the most direct, the most rational antagonist to congestion known. It is always of service and can do no harm.

Subnormal Temperature occurs as an accompaniment of certain conditions, usually in the crisis, or after the abatement of the active symptoms. When so occurring the usual treatment directed to the restoration of the patient under those circumstances, will be found sufficient. But every practitioner meets with patients who are very ill, suffering from symptoms which cannot be named as belonging to any common disease. The temperature he finds to be sub-normal, depressed probably by some influence which acts directly upon the central nervous system, but which cannot be positively determined.

Strychnin is the remedy usually depended upon to elevate the temperature under these circumstances. Good results are obtained from this remedy, or from **nux vomica**, **ignatia**, **xanthoxylum** and **capsicum**. However, I have obtained better results from the use of from two to five or even ten minim doses of **cactus** every hour, than from any of the above named remedies. It acts directly as a stimulant upon the heat centers and upon the nervous mechanism which controls the heart and circulatory apparatus. **Avena sativa** is also of service in these cases. **Myrica** is recommended when sub-normal temperature is induced by chronic malarial conditions.

Cerebral Hyperemia:—The condition of the nervous system is of first importance in the treatment of nearly all diseases. Acute cerebral hyperemia is of not uncommon occurrence. It usually appears with increased

temperature and causes headache, sleeplessness, vertigo or convulsions, and often delirium. It is especially common in childhood, but may occur at any age. The symptoms are a flushed face, with hot skin, bright eyes, with contracted pupils, restlessness, or ceaseless activity, and general nervous excitation.

These symptoms are the specific indications for **gelsemium**, which should be given in sufficiently full dosage, and must be discontinued when the symptoms are relieved. Other remedies are the **bromids** and **ergot**. The latter is especially valuable. With children **ergot** should be given in small and frequently repeated doses. With adults, especially in strong, active males, it should be given in full doses for its immediate effect. **Cimicifuga** and **passiflora** are of service also. When the condition is present during the stage of enfeeblement of a protracted fever, **rhus toxicodendron** is indicated. In extreme excitement, where convulsions are threatened, the **bromids** should be given either alone, or in conjunction with **chloral** or **hyoscyamus**. They are serviceable when there is extreme gastric acidity with nervous excitation.

Cerebral Anemia is occasionally present. This is shown by pallor, by general feebleness and inactivity, by absence of fever usually, and by certain forms of delirium, with vertigo, faintness, nausea and general depression. This condition must be met with stimulants. The specific emergency remedy is **nitroglycerine**, or **amyl nitrite**, for extreme acute cases. These determine the blood to the brain directly. **Strychnin**, **digitalis**, **capsicum**, **avena sativa**, **xanthoxylum**, or brief but sufficient alcoholic stimulation are indicated in given cases. **Camphor** or the **ammonium** compounds will assist in overcoming the condition until the circulation is equalized. In depleted circulation from acute loss of blood, nothing takes the place of the **physiological salt solution**. This supplies the deficiency temporarily, establishing a normal condition of the circulatory

apparatus by restoring the quantity of the blood fluids. Where death seems imminent this should be administered by hypodermoclysis. Often it will be sufficient to introduce it as hot as can be borne into the rectum through a long rectal tube.

Pain is depressing in its effect. It prevents the action of specific remedies and advances the processes of disease. In most cases we have specific remedies for specific pain. In others we have much yet to learn in the control of pain. Stomach pains are often controlled by local measures: By artificial digestives, when induced by indigestible food, and by hydrochloric acid, when that agent is deficient in the gastric juice, by **sodium bi-carbonate** when due to excess of acid. When caused by pyloric spasm, **lobelia** or **gelsemium** will relieve it, as they will when due to neuralgia. **Dioscorea** will control the pain when bilious colic is present.

There are a number of remedies which act specifically upon pain within the abdomen. The pain of peritonitis is controlled by heat and **bryonia**, if begun at once, as is the pain of appendicitis. **Dioscorea** is of service in various forms of colic, besides bilious colic; it will relieve pain from the passage of gall stones, and is of much service in spasmodic conditions within the abdomen. It is also of service in spasmodic and neuralgic dysmenorrhea. Pain of any kind in the pelvic organs is relieved by **cannabis indica**, especially pain and irritation in the bladder and urethra. Other remedies for pain in the urinary apparatus are **thuja**, **kava kava**, **hydrangea**, **gelsemium**, **cimicifuga**, **benzoic acid** in proper combination and **chimaphila**.

Pain in the pleura is first controlled by a sharp mustard plaster, and then by **bryonia** or **asclepias**. The pain of pneumonia is influenced by the same remedies and by the application of **libradol**. Much more could be said of specific measures for pain, but the remedies themselves must be carefully and thoroughly studied, separately, with reference

to their specific pain-relieving properties. The general remedy for pain is **opium** and **morphin**. We give them in the absence of specific agents, but in the smallest possible dosage. In severe traumatism or in any surgical emergency or in a severe burn, a full hypodermic of morphin is demanded, but this agent must be avoided or prescribed cautiously when it covers up or conceals the evidences of progressive pathologic processes in any disease, and especially in appendicitis and pneumonia.

If we could not control pain in the inflammation of serous or synovial membranes with **bryonia**, and other directly indicated measures, we should use small, frequently repeated doses only of the deodorized tincture of opium, or **morphin**, until the influence was seen, and then either give the doses farther apart, or abandon this anodyne and depend upon the specific remedy, which may then be effectual.

I have mentioned farther on in this work a method of combining morphin with a bromid and a mild stimulant, which gives excellent results in many cases where mild pain or general distress, or discomfort are present and demand treatment.

Headache and head pains are controlled by removing the cause and meeting direct indications. There are **gelsemium** and **bryonia** headaches, and also those which are cured by **rhus**, by **ergot**, by **nitroglycerin** and the bromides. Supra-orbital pain due to disordered conditions within the post nasal passages is controlled by **bryonia** and **sodium salicylate**, but head pains must be studied with reference to their causes in every case. A remedy, especially a depressant, given simply because it will relieve the pain, with no consideration of its actual influence, is unsafe treatment indeed.

Severe muscular aching and deep soreness are conditions which exist with nearly all acute fevers. They should be relieved, as they are often the source of annoyance and nervous irritation. Muscular aching is controlled by **cim-**

icifuga in small frequent doses; **arnica** and **hamamelis** administered in the same manner, will control soreness and pain, especially that depending upon violent muscular action or upon injury. **Arnica** stimulates the nervous system to a satisfactory degree at the same time if enfeeblement, depression or prostration be present.

Acute Nervous Irritation and excitability may be induced either by hyperemia or anemia. If induced by hyperemia, as just described, it is usually a condition of exaltation of nervous action, and is best relieved by the sedatives mentioned. When the condition is extreme they must be used to their full influence, often to the exercise of a conspicuous depressing action. This, however, must be avoided when the depression will produce an actual weakness of the heart's action, or will result in any condition which must itself be subsequently overcome by treatment.

If the irritation be induced by anemia it is a condition of depression. Other conditions also may result in exhaustion or in depression of the nerve force, causing irritation and excitability. When a condition of this kind is present, sedatives and depressing remedies must be positively avoided, but the irritability must be relieved by measures calculated to elevate the nerve force, and overcome the depression. This is directly accomplished by properly selected stimulants, by forced nutrition and perhaps by the use of heat. Usually the correctly adjusted stimulant will exercise its influence more satisfactorily if given in small doses frequently repeated. The use of the stimulating alkaloids in this manner is proving of great service. Occasionally a so-called stimulating sedative carefully selected may be administered with excellent advantage.

Reflex Irritation is a condition altogether too large and too important to be fully considered at this time, but it is one of quite common occurrence and one frequently overlooked in the treatment of disease. It causes high temperature at times, erratic and otherwise unaccountable, and

nervous irritation. Profound convulsions may result from it, or it may induce severe local spasm. It irritates the action of the heart in various ways, resulting in palpitation, excitable action, irregularity or intermittency, with dyspnea, vertigo, nausea, and depression. It interferes with the action of the stomach, inducing persistent vomiting, complete loss of appetite, and indigestion, or extreme pain. It induces various forms of diarrhea, which may be severely bilious in character, or the movements may be large and watery. A long train of reflex symptoms, which may be general in character, may result from intestinal irritation, and are usually ascribed to worms, although more commonly undigested food in a state of decomposition or toxins from imperfect digestion may be the cause.

In the treatment of reflex irritation the cause should be determined and immediately removed. When the cause cannot be readily determined, however, the intestinal canal must be evacuated without irritation. Other emunctories as well as the orifices of the body must receive attention. There is no doubt that orificial irritation is a common cause of reflex irritability, in chronic or sub-acute cases. A general condition of much importance, which is often induced by reflex irritation, and the cause entirely overlooked, is neurasthenia, which may be acute in character, but is usually sub-acute or chronic in its development.

When the reflex irritation is unaccompanied with depression, and the cause cannot be determined, a nerve sedative properly selected will usually relieve it. Irritability of the heart yields to **gelsemium**, **cimicifuga** and the **bromids**. Irritability of the stomach is often very difficult to control. Its treatment in full will be given under its proper heading, as will irritation of other organs. In reflex nervous irritation in young girls, from menstrual or ovarian causes, I have found **damiana** in large doses an excellent remedy. I have found **santonin** almost specific in the relief of reflex irritation, when the cause is unknown. I was led to the use of the remedy by its effect in a case of intestinal

irritation, which I supposed was caused by worms. It relieved the irritation admirably, but I made the discovery that no worms were present. I was forced then to attribute the influence to nerve sedative properties in the agent, which had not been previously ascribed to it. I then used it in reflex coughs, and reflex irritation of the heart, and other reflex irritations and invariably with success. I advise that it be used freely, but with caution. If a frequently repeated dose of one grain does not produce satisfactory results, the dose may be increased in selected cases, to its maximum, looking always for renal or intestinal irritation, or for a profound depressing effect.

Secretion:—The condition of the secretions must be considered in every case. Elimination seldom receives sufficient attention in any disease. With the suppression of the secretions there is always a demand for increased elimination. The evidences of suppressed secretion are dry skin, dry mouth and tongue, deficient renal action and constipation. These, however, are not all of the evidences, and these are sometimes misleading. There may be perspiration and yet the solids carried off through the skin may not be properly secreted. The action of the kidneys may be such that the solids are not eliminated while the patient is passing considerable water. On the other hand, elimination may occur quite readily from the intestinal glands and yet deficient peristalsis interfere materially with proper evacuation of the bowels. Or retention of urine may occur from spasm of the sphincter or from urethral spasm. In these cases reabsorption results in autoinfection.

Our best general stimulant to the secretions in acute sthenic cases, is *jaborandi* or *pilocarpine*. These may be given in repeated small doses, but where patients who have previously been in excellent health and are vigorous and active, are attacked with profound congestion at the onset of an acute disease, a single full dose may accomplish all

that is necessary. This remedy usually influences the skin first. In some of my cases it has produced extreme salivation, to be followed by a mild action upon the skin and free action upon the intestinal tract and upon the kidneys. It usually stimulates the action of the mucous glands uniformly throughout the whole body. Jaborandi can thus be given during the sthenic stage of protracted fevers. It overcomes dryness of the mouth, and of the skin, prevents constipation and stimulates the action of the kidneys. It is usually best given in doses of from two to five drops every two hours.

Elimination at the onset of acute disease, has long been promptly and satisfactorily re-established by the use of hot foot baths, hot diaphoretic drinks and induced perspiration. A most satisfactory course in acute high temperature is to envelop the patient in a wet sheet, adjusting the temperature of the sheet to the condition of the patient. If the patient be vigorous and the fever high, the water may be quite cool; in feeble patients it should be but little below the temperature of the body, and in cases suffering from depression it should be above the body temperature at 100 F. to 110 F. This should be wrapped with a warm flannel blanket until reaction and free perspiration occur.

We have a long list of remedies which can be selected for their influence upon the skin, or upon the other secreting organs. We do not advocate the use of irritating cathartics. Many cases demand a free laxative and thorough evacuation of the bowels, but this must be accomplished always without irritation. The best stimulant to renal deficiencies is persistent heat, which may be applied dry or moist. Moist heat is preferable, and in cases where from sepsis, acute cold or other cause, immediate suppression of urine occurs, heat must be used externally, in conjunction with an intestinal flush, as hot as can be borne. If possible the lower bowel should be filled with hot water and this should be retained.

When secretions are excessive, these must be restrained.

This is best done by the use of **belladonna**, **stramonium**, and astringent remedies, which may be applied in accordance with the indications existing. Excessive mucus secretion is difficult to restrain at times. An extreme out-pour of mucus whether from the bronchial tubes, from the stomach or from the intestinal canal, may be controlled often better with **turpentine**, than with other remedies. This may be given in doses of from two to five drops, on sugar slowly dissolved in the saliva within the mouth and the saliva swallowed.

Turpentine will meet certain indications of deficient secretion most satisfactorily, paradoxical though this statement may seem. It is given in typhoid conditions, with or without tympanites, when the mucous membranes are dry and dark red, the tongue dark red, thin and pointed, and coated with a brown or black coat, with sordes on the teeth. It may be given in the form of an emulsion if so preferred.

The Tongue:—The condition of the tongue has been referred to in part, but there is much more that should be said of it as presenting strong indications for treatment in acute febrile and inflammatory disease. All of these conditions cannot, however, be presented here. In addition to what has been said there is a condition most common during malarial fevers in which the tongue is broad, thick and pale, and is coated with a thick coat which is dirty or yellowish white, at first, but inclines to brown as it persists. This coat may finally become smooth on the top, like porcelain, apparently encrusted and very brown. With this there is no appetite, rather a disgust for food; there is lassitude, disinclination to effort, decreasing strength, mental dulness, and finally delirium. This condition demands an emetic. We do not advise emetics as often as formerly, but this is one of the cases in which a thorough preliminary emetic will change at once the entire condition. As an emetic we may use **ippecac** or **lobelia** or

apomorphin, or **eupatorium** if masked malarial symptoms are pronounced. **Baptisia** is demanded in protracted fevers when the tongue is coated brown, and inclined to be dry, with an inclination to sordes on the teeth. Twenty drops of specific baptisia should be added to four ounces of water, and with the indicated fever remedy this should be given in dram doses every hour or two. This agent is demanded by dusky discoloration of the tongue, by a tongue covered with a moist, pasty coat, with foul breath, or by a sleek, dark red, raw-looking tongue, with inactivity of the stomach. It may be given advantageously with other agents which have similar indications. **Rhus toxicodendron** and certain acids meet these indications at certain times also, as determined by a thorough study of these remedies. In all cases a thorough study of the remedy is fully as important as the study of the disease.

Hyperacidity:—I am convinced that many prescribers fail at times in obtaining results from any measures, which might be obtained by very simple remedies, if excessive acidity of the stomach and intestinal tract be first neutralized. It is well known that frequent severe attacks of pain which are attributed to extreme causes, such as biliary calculi, or hydatids of the liver, or to chronic ulceration or even to malignant disease, are controlled and the condition disappears under the use of half dram doses of the **sodium bicarbonate** alone. I have been frequently called to treat severe and intractable neuralgias where chill and fever were present, or to administer relief for toothache, and have known of the teeth having been extracted for the pain, where the condition was entirely relieved by a few full doses of a well selected alkaline remedy. A simple, reliable saline laxative is often of great service.

The specific indications for alkaline treatment—the evidences of hyperacidity—are a broad, thick tongue, free salivary secretions, and pale mucous membranes. The tongue is usually coated with a uniform, moist, white coat.

There is a lack of appetite and poor digestion. The **sodium** or **magnesium** compounds administered in acute disease with these indications, are of incalculable service. They sometimes relieve the other conditions so positively that but little specific treatment is needed. Prof. Scudder was a strong advocate of the use of the **sodium sulphite** when there was excessive hyperacidity, with lack of tone and decomposition of food. He gave as his indication for this remedy, pallor of the tissues of the tongue, which was broad and coated with a thick white, yellowish white, or dirty fur, and always moist. It prevents gastro-intestinal fermentation, and is specific for the vomiting of frothy and yeasty matter. When these conditions are present it reduces the temperature, relieves nervous excitement and greatly improves the appropriation of other remedies, and encourages the digestion and assimilation of food.

Our **Neutralizing Cordial**, the compound syrup of rhubarb and potassium, is a very important remedy for hyperacidity, and now generally used for this condition by the profession. It tends to correct all abnormal gastric and intestinal conditions that have been induced by, or act as causative factors to the hyperacidity. Magnesium sulphate in small doses is an excellent remedy, and magnesium citrate and calcined magnesia are of much value.

Deficient Acidity:—The demand for acids in the system, when it exists, is another very important condition. It comprehends the group of symptoms that are described as typhoid, but may vary from a simple dark red appearance of mucous membranes, to an extreme typhoid condition with sordes, with entire absence of the salivary secretion. The tongue, which is quite dry, is long and thin, with thin edges and a pointed tip. Ultimately a dirty coat forms in the center of the tongue, which quickly becomes light brown, then dark brown, and finally, if there is extreme high temperature and great depression, the coat may become black. If begun early, acids properly admin-

istered in any acute condition will often prevent the development of this train of symptoms. If omitted at first, they must be administered in larger doses and more frequently. They may be given in water as a beverage, and sweetened.

Hydrochloric acid is the acid most frequently selected. **nitrohydrochloric acid** was advised by our older writers, when with the evidences of a deficiency of acids, there was marked torpor of the liver or other perverted liver action, without obstruction to the flow of the bile. **Nitric acid** is indicated when the mucous membranes are violet, carmine, or of a clear red color, the mucous membrane appearing as if it were transparent, the red color showing through it, distinctly. **Sulphuric or sulphurous acid** is of service when the tongue is dry and deep red at the tip and edges, and when the brown coat increases in color to black from the edges to the center. It is also of service when the tongue is sleek and dry, the papillae generally diminished. **Phosphoric acid** is of much service where, with the above appearance of the mucous membranes, there is excessive prostration or any great degree of nervous debility.

There is a condition in which hydrochloric acid alone is deficient in the fluids of the stomach. This results in impairment of the digestion and is more common in sub-acute and chronic cases than in acute cases. The evidences of this are extreme gastric atonicity, anorexia, a moist tongue, with elongated papillae, which are red at the base, but are tipped with a white coating through which the pinkish redness of the base can be readily seen. This appearance is uniform over the entire surface of the tongue. The judicious administration of **hydrochloric acid** will usually correct this condition.

Insomnia:—Sleeplessness depends upon many factors and should have much more thorough consideration than I can give it here. It occurs independently of any well defined disease, or it occurs as a most troublesome factor

during the course of severe acute disease, preventing rest or restoration, and interfering with the normal action of every function of the body. It prevents the proper action of remedies administered for important conditions, results in cerebral irritation, and in severe cases it may cause or increase delirium. Independently of disease, it occurs as a result of bad habits of working, thinking, eating or sleeping. It results from temporary cerebral hyperemia, or from cerebral anemia.

In sthenic cases with cerebral hyperemia, the patient should eat sparingly at the evening meal and nothing afterward before retiring; should spend the evening quietly and restfully at home, and should sleep in a cool room with the head properly elevated, and with the least bed clothes possible. He should take no stimulants of any form after noon, and should avoid them *in toto* if the condition is persistent. If the condition induces cerebral excitement, he should have a constitutional treatment, calculated to unload the system of urea and uric acid and which will promote normal excretion, and when everything is favorable he may for three nights consecutively take a cerebral sedative, selected with a view to relieving the brain of excess of blood. This should be taken in a full dose the first night, and in decreasing doses on three following nights. **Gelsemium** in five minim doses, or **sodium bromid** in ten or fifteen minim doses, with ten drops of **ergot** will often be all sufficient. The medicine should be omitted for a period of three or four nights, when, if the sleeplessness continues, this course may be repeated. No patient should know what he is taking for insomnia, nor be allowed to procure it for himself. **Chloral** should be used only in extreme cases, and then only on the prescription of the physician. I avoid other synthetic remedies entirely, because of the habits soon induced and because of their deleterious influence on the blood and upon the digestion and assimilation of food. Cold applications to the head are beneficial with these patients. One suffering habitually from cere-

bral hyperemia should, in riding in a sleeping car, always sleep with his head toward the engine.

In cerebral anemia with any degree of debility or exhaustion, the patient should have a full but easily digested meal at six o'clock p. m. and upon retiring he should drink from half of a pint to a pint of hot water, or he may drink instead, in sips, slowly, a glass of hot milk, and eat a few graham crackers or salted crackers, or drink a bowl of hot beef tea with crackers. He should sleep with the head low, and perhaps the lower extremities a little high. It is best to sleep without a pillow, or in extreme cases the foot of the bed may be elevated two or three inches. The bed should be comfortable and warm, with sufficient coverings. One suffering from cerebral anemia should sleep, when riding in a sleeping car, with the feet toward the engine. An unusually refreshing sleep may result.

Sleeping remedies in anemia must not be sedative to a pronounced degree, but should be slightly stimulating, and administered with care. The **monobromated camphor**, or in some cases the **ammonium bromid**, are indicated, or minute doses of **nitroglycerine** repeated two or three times.

When patients are persistently wakeful, the habit of excluding everything disturbing from the thoughts can be readily acquired. They should force themselves to think of but one thing, and that, something of no importance whatever. The simple expedient of breathing through the nose and imagining that the breath is seen and watched, until it disappears, is good. I have kept my thoughts fixed upon what I dreamed before I awoke, or upon a foolish dream of the past, with best results. I am soon dreaming again. Other similar courses are all based upon the necessity of composing the mind to calm and rest. In acute disease the exciting conditions must be considered and attended to.

Medicine is justifiable, but it must be specifically administered. **Gelsemium**, **passiflora**, **hyoscyamus**, **scutellaria**,

valerian, conium and cannabis indica are all mild soporifics. Hyoscyamus is excellent in small doses frequently repeated, for two hours before the bed time, for infants and those advanced in years, or those especially feeble. If given to strong adults, the dose must be full and large, and to obtain its best action it must meet its own indications.

Passiflora in full or large doses will prove satisfactory more often than any one of the remedies named. In a high degree of nervous irritation or nervous excitability, where gelsemium fails, the bromides or small doses of chloral may be used, given in a menstruum acceptable to the stomach. Hydrobromic acid will often prove a useful remedy.

None of these remedies is successful when severe pain induces wakefulness. Here small doses of opium or morphin may be used, or jamaica dogwood, if specific measures to control the pain are not available or successful. I give opiates in small doses frequently repeated until the result is obtained, and desist at the earliest possible moment. In severe acute pain a hypodermic of morphin will be demanded. In giving morphin for pain and to produce quiet and rest, especially after a surgical operation or after confinement, I have had most happy results from the use of the following formula and have yet to witness the least unpleasant result, even after severe operations, where vomiting is severe: Morphin, one grain; hyoscyamus, ten minims; sodium bromid, from one to three drams according to the amount of nervous excitability; tincture of capsicum, ten minims, in syrup of tolu, simple syrup or water, two ounces. Of this a teaspoonful is given every ten, fifteen or twenty minutes until from three to five doses are given. This will soon produce tranquillity and relief from pain. Vomiting usually ceases and sleep quickly follows. In mild cases, two doses are sufficient. And once relief is obtained a dose given three or four times within twenty-four hours will preserve the condition of relief perfectly.

Fever:—During any disease the maintenance of a normal temperature is of the utmost importance. Where the disease factors have produced either sub-normal or hyper-normal variation, this must be corrected. I lay it down as a principle that must not be violated, that elevated temperature should always be treated as such, and must receive first attention. However simple an elevated temperature, it should never be neglected.

I am aware that even the best of our antipyretics fail at times to control pyrexia; and because of this, to justify the failure of the physician I think, a theory has become popular that fever is a conservative and essential condition—is nature's effort to rid itself of the causes which underly the condition. This is a most erroneous opinion. Fever is as much the result of the chemical forces at work, from the antagonism of the causes of the disease to healthy tissue and fluids, as heat is the result of the chemical processes involved in the fire which would reduce my house to ashes, and I would no more be justified in neglecting the one than the other.

This is practically true in the fevers of childhood. In many cases temperature is the result of simple causes, which may persist or may not; but persistence of elevated temperature rapidly induces other pathological ills which are more serious, such as acute hyperæmia of an organ or part, and which may soon be followed by the usual consecutive processes of a developing acute inflammation.

The positive treatment of the initial fever immediately, stays the further development of the pathological processes, often, and in many cases wards off nerve irritation, with its train of symptoms, or prolonged inflammation, with its dire results. Further, where we have evidence of initial development of these processes the factors that underlie their development are often retarded and checked by the positive control of the temperature. This position can be defended by unanswerable arguments.

Of simple fevers not specifically diagnosed, Dr. William Pasteur says:

"Simple fevers are very common in childhood, and their early recognition is of great practical importance. They may be roughly grouped under the following heads:

"1. Abortive or incomplete forms of the specific continued fevers,—typhus, typhoid and relapsing fever. Cases of irregular type may occur at any time, but are more frequent during the epidemic prevalence of these diseases.

"2. Cases of scarlet fever, modified variola, and, more rarely, measles and erysipelas, in which the eruption is either absent or unnoticed.

"3. In rare instances, anomalous forms of intermittent fever.

"4. Fevers due to the effects of some localized inflammation, in which the local signs are transient, ill developed, or beyond the reach of observation. Cases of this kind occur in connection with lymphadenitis, tonsillitis, and acute catarrhal affections of the alimentary and respiratory mucous membranes.

"5. The whole group of fevers which are caused by disorders of digestion, attended by the absorption of toxic substances.

"6. Fevers depending on some disturbance or exhaustion of the nervous system as a consequence of exposure to heat, or of some peripheral nerve irritation. Also those depending on mental disturbances and those of reflex origin, the cause of which is obscure or indeterminate."

With some neurotic, excitable or hysterical women, a high temperature will sometimes result from anger, extreme nervous excitement, or from anxiety when some other disease is present. I have found patients, when convalescing, to develop a high temperature for a few hours after entertaining company in the sick room. I have found nervous women, after a satisfactory confinement, develop a temperature with every visitor that was admitted; or to have an increase of temperature upon hearing startling

news, or upon being disappointed. I have known the high temperature in these cases to persist until local inflammation was induced. Such inflammation is often erroneously attributed to sepsis. But sepsis may be absent, in which case the inflammation will be the direct result of the influence of the high temperature. This condition must be treated with quiet, rest and remedies calculated to soothe the nervous irritability. It will be found that there is some exhaustion or prostration present, and a carefully selected stimulating sedative will be needed. The causes of irritation, as has been stated, must be arbitrarily excluded, and the digestion and appropriation of food, and the selection of foods, must have careful attention.

Fevers in which there is a regular and marked morning remission with the evening exacerbation occurring at about the same time each day,—one rise and one fall only in each twenty-four hours,—are favorable and readily amenable to treatment. When the temperature continues to increase after midnight, with no abatement in the early morning or with irregular rise and fall during the day, or where the temperature remains stationary at a point above 102.5° or 103° F., the conditions are not so favorable,—are more intractable, and less responsive to the measures used.

The following specific statements concerning the medical treatment of fevers, refer only to the above mentioned, and other erratic and unusual manifestations of fever. The medical treatment of fevers of regularly and definitely known types, is considered fully elsewhere, each under its proper title. The general suggestions here made are applicable to all fevers.

Treatment:—A high temperature in a positively asthenic patient must be treated entirely different from the ordinary fevers. In asthenic fevers, *aconite* in quite small and frequent doses, *bryonia* or *rhus toxicodendron* will be found indicated. This latter remedy is indicated when the tongue and mucous membranes are dry and red, when there is cerebral irritation, or when with the exhaustion

there is flushed face and bright eyes. With the intestinal irritation there is usually tympanites.

When there is a general asthenic condition with fever, accompanied with irritability and feebleness of the heart's action, **cactus** will reduce the fever and soothe the irritability of the heart.

Where the fever is induced by reflex irritability, it has been immediately controlled by **santonin** in one-grain doses every hour or two, when all other measures had persistently failed. **Echinacea** will be found of great value in fevers caused by pyemia or septicemia. It will antagonize the toxins and exercise a sedative influence at the same time.

In the treatment of persistent fevers the first attention should be paid to the stomach. Incorrect feeding and over-eating are common faults, and disorders of the stomach and bowels are of very frequent occurrence. If the evidences of excessive acidity are present, with resulting fermentation and presence of gas, the syrup of rhubarb and potassium,—the **neutralizing cordial** of the older physicians,—is a most rational compound and meets the indications in a very great majority of the cases. In children especially, a dose of this will remove the cause of many cases of sudden fever and acute gastric or intestinal pain, and with the removal of the cause the symptoms of the disorder will disappear. The use of **lime water** is too frequently advised with infants. While a most serviceable remedy, no inorganic chemical agent of a character so positively opposed to the presence of the essential free hydrochloric acid of the gastric juice, should be advised *ad libitum*, as this is so commonly advised by many physicians.

Physics and active laxatives should be made use of only when indicated. The old tradition that a physic is needed every time any disorder threatens is erroneous in the extreme, and is frequently the cause of the sudden and rapid development of severe phases of the disease, or of a positive

increase in the disease phenomena, without being so recognized.

Flushing the intestinal canal with a large volume of hot water can do no harm, and is often of immense value. This may be repeated until the fluid returns clear. If the patient is aged or one previously enfeebled by chronic disease, or one suffering from a chronic disease of the heart, the physiological salt solution may be used hot, instead of hot water, and as much as possible should be retained in the bowels.

In introducing a large quantity of the fluid, the patient should lie on the left side with the hips elevated, and a small compress may be held flat over the anus when it is desired that the fluid be retained.

The use of a mild **saline laxative** is often of great service. The specific indications are a broad, thick tongue, coated white, with a yellowish tinge to the coat in the center of the tongue, the mucous membrane being pale.

I cannot conceive of a more foolish procedure than persistence in the use of physics when the mouth and tongue are dry, the mucous membranes a deep red, the tongue pointed, thin and narrow, with red tip and edges,—positive evidence of the lack of secretion, and of a deficiency of the acid elements, or of an excess of alkaline constituents. If a laxative is used at all it should be acid or neutral in chemical reaction, or given in conjunction with free acid drinks; never alkaline under these circumstances.

The use of a **hot footbath** at the onset of a fever is a domestic measure of scientific importance and value, and should seldom be omitted. Where the chill was markedly severe at the onset of the fever, a hot bath may be given first. The patient should be taken from the bath, wrapped in warm blankets, the feet immersed in a deep vessel containing water pungently hot, to which is added a tablespoonful of mustard to each gallon. Pleasant hot drinks may be administered also. When, after twenty or thirty minutes, the patient is placed in bed, the blankets should be

slowly removed, the perspiration being continued for an hour or two, according to the previous condition of the patient. This course is often much more effective than medicine, in breaking up colds and warding off the results of a chill, and the accompanying fever.

It is often important that at the sudden onset of fevers the patient be deprived of food entirely for several hours. The obsolete practice of administering an emetic was often of great value, but unless the stomach be greatly overloaded, rest, with perhaps a mild digestive if there is distress in the stomach, will often be sufficient. Subsequently small quantities only of simple foods should be taken.

In simple sponging, the face, trunk and limbs are sponged for from ten to twenty minutes with water,—cold or tepid, or even hot, as the patient may express a preference. In markedly sthenic cases, water as cold as fifty degrees may be used; but in children cold water readily produces shock, and a temperature of sixty-five to eighty degrees is preferable and more efficacious. When cerebral hyperemia seems to threaten, by flushed face, hot head and bright eyes with contracted pupils, cold compresses to the head are essential. They should be frequently changed. The wet sheet pack, fully described elsewhere, is of excellent service in aborting simple fevers.

Febricula.

Synonym:—Simple continued fever.

Definition:—A fever of short duration devoid of the characteristics of any invariable definite lesion. Many of the facts previously stated concerning fevers are applicable to this.

Etiology:—This form of fever depends upon simple causes, not plainly apparent, often, such as digestive disturbances, excitement or exhaustion of the nervous system, exposure to cold or to the extreme heat of the sun. It is often followed by definite forms of severe continued fever. If febricula is not immediately controlled, as it may

nearly always readily be done, it may be the precursor of well developed local inflammation in some organ or part. The sudden occurrence of a sharp attack of fever, in a previously healthy patient, especially in a child, may be safely diagnosed and treated as febricula, if meningeal invasion be excluded.

Symptomatology:—There is a sudden rise of temperature usually preceded by a chill. There is headache, hot, dry skin and suppressed secretions. The tendency of the fever is to continue from twenty-four hours to four or five days, when the temperature gradually abates without complications.

Treatment:—The pyrexia should never be neglected, because simple. The simple indications for treatment should be met by the specifically indicated remedy. Depressing antipyretics should be avoided in children. In isolated cases of previous robust health, in adults, a dose of one of the synthetics might be given and sometimes repeated once or twice, not more than three times. In children and elderly people, **aconite** is the remedy par excellence. A mixture is prepared of five drops of the tincture in four ounces of water. This is given in dram doses and repeated every fifteen or twenty minutes at the onset, for two or three hours, and then at longer intervals. The patient should be kept quiet in bed, and simple sponging may be resorted to. Food in any considerable quantity should be avoided.

The **phosphate of iron** in very small doses in hot solution—about one grain in two ounces of water—may be given in dram doses, every ten, fifteen or twenty minutes, with beneficial results, especially where the temperature is above 103° F.

The development of distinct forms of continued fever, or of any of the exanthemata, or of local inflammation should be constantly and keenly watched for, and promptly met by the indicated remedies.

INFECTIOUS DISEASES.

Malarial Fever.

Definition:—A form of fever, non-contagious in character, but resulting from a specific infection; marked by distinct periodic intermissions or remissions and exacerbations. There is usually splenic enlargement, with liver complications and destruction of the red blood corpuscles, resulting in anemia.

Etiology:—The disease results from the introduction into the blood of a specific microorganism, the hematozoön of Laveran, correctly termed the *hemamebæ malarix*, better known as the *plasmodium malarix*. The predisposing causes are, residence in a low, flat, poorly drained locality, near swampy or marshy land. It is more common in the early spring and late fall, and occurs more readily from outdoor exposure after sunset.

The anopheles mosquito has been proven to be the host of the *plasmodium malarix*. The spores are excreted by the salivary glands of the mosquito. A mosquito that has bitten a malarial patient passes the infection on by biting a person not infected. Where malarial patients are screened from mosquitoes and where also those not infected sleep under netting, and especially where the breeding places of the mosquitoes are disinfected with crude petroleum and the marshes drained, the infection is rapidly and surely reduced. The belief that malarial poisoning is due to certain "miasms" or exhalations from swampy ground has been disproven by the fact that persons protected from mosquitoes living and sleeping for an extended

period of time in such malarial territory have remained free from malaria.

Furthermore, malaria has been directly communicated by the bites of mosquitoes known to have fed upon the blood of malarial patients in a distant country, as in the experiments of Patrick Manson, in England, upon his son. Manson received infected mosquitoes from Italy, and their bite promptly communicated the disease to his son. In the blood of young Manson was found the same parasite as was observed in the patients in Italy.

The name malaria includes several varieties of fever, all from the same cause, and all characterized by periodicity. Malaria may be present in the system and not apparent until some other cause develops fever, or local inflammation, when periodicity in remissions or exacerbations of the fever appear and prove the presence of the germ, demanding treatment for its destruction.

The common manifestations of malaria are, **remittent fever, intermittent fever, masked intermittent fever, pernicious malarial fever**, or congestive intermittent fever and the presence of the **malarial cachexia**. Each of these forms of fever will have separate consideration.

Varieties:—When the three stages of the disorder follow each other in regular and immediate succession, occurring with the intermission, in each twenty-four hours, the form is called quotidian. This is the most common form. When the attack occurs only on every other day, it is called tertian, on every fourth day quartan. There are double forms of the disease. In double quotidian there are two distinct attacks each day, one in the morning and one in the evening. In double tertian, there is one chill each day, but it occurs on the morning of one day and in the evening of the next day. The double quartan occurs on two successive days, on the third day there is no attack.

INTERMITTENT FEVER.

Synonyms:—Ague; chills and fever; fever and ague.

Definition:—That form of malarial fever in which at regular intervals, a complete disappearance of the fever occurs, the temperature falling to, or slightly below the normal point. All the disease phenomena abate and the patient for a short period is in a nearly normal condition of health, except the consequent prostration.

Symptomatology:—The disease exhibits three phases in each of its entire periods. The first of these is the stage of chill, or the cold stage; the second is the stage of fever, or the hot stage—the stage of reaction; the third is the sweating stage; then follows the period of intermission and cessation of all active phenomena. Preceding the phenomena of ague, often for many days, there are malaise with headache, languor, an indisposition to exercise, and general listlessness. The chill occurs more commonly in the early part of the day, from eight to eleven o'clock. As the time of the chill approaches, the patient yawns and stretches, the nails become purple, the skin becomes pale and cold, and the lips blue as the chilliness occurs. The chill increases to rigor, with thirst, trembling of muscles and chattering of the teeth. In some cases the chill is sudden and very pronounced, in others there is but slight chilliness.

Early in the chill the thermometer will show an increase in temperature, and the pulse becomes rapid, small and usually hard. The skin assumes a dull leaden color and is contracted and roughened. For a time the capillary circulation is very imperfect, the respiration is labored and the secretions deficient. The stage of chill may be of but a few moments duration, or it may be prolonged for three or four hours.

While the temperature is rising, during almost the entire time of the chill the symptoms of reaction are not markedly apparent, until the chill abates. As the coldness

disappears, the patient becomes cheerful, the respiration becomes free, the skin becomes warm, and finally hot and burning, and the pulse quickens, but is fuller and of better strength. The patient is inclined to be restless, with some irritation of the nervous system. There is pronounced headache, with flushed face and suffused bright eyes; there is nausea and vomiting and the thirst persists. There is deep muscular soreness and sometimes extreme muscular pain. The secretions are locked, the mouth is dry, the tongue dry and often cracked, the urine scanty and of a dark color, usually without sediment, and the bowels are constipated.

This stage lasts for a longer or shorter period, often inversely as the chill was or was not prolonged. Most commonly the chill has abated and febrile symptoms fully developed before noon. The temperature reaches its height at from three to six o'clock in the afternoon and remains stationary for from two to five hours, when the decline occurs. The fall in temperature is abrupt, occurring soon after midnight. The sweating stage lasts through the remainder of the night.

On the decline of the temperature the pain, restlessness and discomfort abate, perspiration begins and all the secretions are restored. The patient falls into a refreshing sleep and awakens after some hours, somewhat weakened, but otherwise in a normal condition. If the disease persists, the chill occurs sooner each day, the reaction is more marked, the temperature is higher, with each recurrence, and the patient becomes debilitated with disordered functions of the nutritive and blood making organs.

Diagnosis:—The marked intermission is the differential diagnostic feature of this disease. The regularly occurring stages are characteristic. Microscopic blood analysis determines the actual presence of the hematozoon.

Treatment:—During the progress of the active stages of the disease, there is but little that can be done for the existing phenomena, and measures directed to these

conditions, at that time, have but little permanent influence, unless the cause is removed and the malarial parasite within the system is destroyed. Heat applied at the onset of the chill—a hot bath or a hot footbath, with hot drinks—is of much benefit, and is gratifying to the patient. The indicated remedies however should not be withheld as the total results depend upon their influence.

It is generally acknowledged that **quinin** is the typical specific antidote to malaria, and to its periodic manifestations. While this is true, there are some errors of common acceptance concerning this remedy which should be corrected, and much concerning its specific application that is not generally known. These errors are: the belief that it is a harmless remedy; that it is an antipyretic; that its efficacy is in proportion to the size of the dose; and finally that it must be given during the progress of the fever or chill, when there is often but little appropriation of the remedy, often only sufficient to irritate the nervous system.

There is no remedy that has more plainly marked specific indications than quinin, or that will give more excellent results, when given in accordance with its indications. If the skin is moistening or soft, the buccal secretions restored, the tongue moist and clean, or inclined to clean, the temperature normal or declining and below 101° F., quinin will be properly absorbed, and will produce its full desired results. In tests quinin destroys the *plasmodium malariae* in the proportion of one part to twenty thousand parts of water. Its influence in the system is correspondingly prompt, if properly administered.

Quinin is best given in broken doses. It should be given only during the decline of the fever, or during the intermissions. In mild cases from two to three grains of the sulphate, given five hours before the expected chill and repeated every two hours, until three doses are given, will modify the anticipated phenomena on that day, and will produce marked amelioration if so repeated on the second

day, with the entire abatement of the total phenomena on the third day.

The rationale of giving quinin several hours before the expected chill in malaria is in the fact that the chill takes place when the spores of the plasmodium are poured into the blood stream. The organism develops within the erythrocytes and bursts at sporulation. Quinin given at the proper time before sporulation is in the circulation and ready to promptly kill the parasites.

In severe or protracted cases, and in cases where the evil effects of the disease upon the liver and spleen are apparent, I have made the following combination, with most happy results:

℞ Quininae sulphatisgr. xl
 Leptandrinigr. iv
 Capsici pulv....gr. vi
 M. Ft. capsulæ No. xii.

These capsules are to be given, one every two hours until three only are taken, beginning as above specified. This is the extreme quantity of ten grains of quinin within four hours. This anticipates the attack and permits the full antiperiodic effect of the agent, which is assisted in its absorption and is greatly increased in its stimulating influence by the capsicum. I have for a long time made it a routine practice to combine from one-eighth to one-fourth of a grain of **capsicum** with each grain of quinin and I am sure I obtain better results. The leptandrin acts directly, but mildly, upon the liver.

In long standing cases of this form of fever, where the resultant anemia is pronounced, it is good practice to add **iron** to the quinin in the capsule. From one to three grains of **ferrocyanide of iron** in persistent or intractable cases will be found of much service. This remedy has, at once, an antiperiodic, stimulant, tonic and restorative influence.

In the treatment of intermittents, in infants, the best course to adopt is the administration of quinin by inunc-

tion. As soon as the decline of the temperature is plainly observed from three to five grains thoroughly incorporated in lard or lanolin should be rubbed into the skin of the axillæ, groins, and sides of the abdomen. This may be repeated two or three hours before the expected chill, and the course repeated on each successive day for several days.

When in the treatment of any case, the results of this course are apparent, and the phenomena are modified sufficiently or interrupted entirely, from two to three grains of quinin should be given every two or three hours during the entire twenty-four hours. If the appetite has not returned and the digestion is impaired, the quinin should be combined with **hydrastis** or **berberine**. If there is extreme atonicity of the gastro intestinal tract, the capsicum should be continued. If the nervous system be enfeebled or prostrated, one-eighth or one-fourth of a grain of **nux vomica** should be given with each dose of the quinin.

During the stage of congestion **belladonna** is a remedy of great efficiency. It may be given in doses only short of its marked physiological action. The old writers advised the use of **xanthoxylum**, and claimed to obtain excellent results. In its influence it occupies a position as a stimulant between belladonna and capsicum. With the advent of the fever, **aconite** is usually indicated, and in recent cases it should be given in positive doses, throughout the entire progress of the fever. It is a good plan to continue belladonna with the aconite, but in greatly diminished doses.

In patients especially susceptible to the action of quinin, its effects are obtained, without inducing nervous excitement and tinnitus aurium, by prescribing it in conjunction with **gelsemium**. The physicians of the south claim that they obtain all the favorable results of quinin in malarial disorders, and a minimum of unpleasant manifestations, by this combination.

When an attack of intermittent fever has been brought under control, it is necessary to watch for its recurrence, on the seventh, fourteenth, or twenty-first days from the

time of the original attack, and any symptom on these days should be promptly met by the indicated remedies.

Strychnin in full doses in the intermission, acts as an antiperiodic in certain atonic cases. **Arsenic** is thought by some to exercise a beneficial influence in that class of cases where, though the symptoms are not marked, they are persistent and somewhat intractable to ordinary methods. Good results are claimed, both from persistent large doses and from the use of the homeopathic triturations of arsenic.

The **ammonium picrate** is an active antiperiodic as well as possessing tonic and restorative properties where there are debilitating and exhausting discharges. It will be found useful in those cases in which quinin cannot be tolerated, or where the remedy has failed to accomplish the desired results. In convalescence, **iron** in some form is demanded, and the use of other restorative tonics will be found necessary. These should be selected with careful judgment and discrimination.

PERNICIOUS INTERMITTENT FEVER.

Synonyms:—Congestive chill; pernicious malarial fever; malignant malarial fever; congestive intermittent fever.

Definition:—A sudden, profound, general congestion accompanied with a violent chill and rapid, serious, often fatal prostration exhibiting the phenomena of surgical shock. Relieved by active measures it is apt to recur at the same hour on the second or third day.

Symptomatology:—In one typical case thoroughly studied by the author in an extremely malarial location on the Vermilion river bottoms in Illinois, there were malarial symptoms for several days preceding the attack, with distinct periodical manifestations occurring the same hour on which the congestion occurred at this time. The attack

had almost no premonitory symptoms, the onset being abrupt. Within an hour there was marked pulmonary, hepatic, splenic and renal congestion, with some symptoms of cerebral congestion. The heart and respiratory functions failed rapidly, the pulse soon becoming small, thready, easily compressible and very rapid. The temperature was pronouncedly subnormal. There was a sensation as of the coldness of death. This was the only complaint made.

In the reaction which was induced by the most active measures, the temperature did not reach an extremely high point. There was extreme prostration, from which the patient was a long time in recovering.

In some cases there is great distress at first; the patient then becomes lethargic and sensibility is diminished; the skin is damp and very cold, dusky in color, at times almost purple; the pulse is at first full, large and slow, until the prostration is marked, then it increases rapidly and becomes small, weak, thready and easily compressed.

There are three forms of the disease. The **Algid form** is that described above, with the addition, in some cases, of nausea, vomiting and purging. In the **Comatose form** the congestion expends its force upon the brain. There is at first abrupt delirium, followed by deep coma. The constitutional symptoms are as above described, but usually in a modified form. The patient may not rally. In some cases there is a reaction after the first attack, to be followed by a more severe attack, from which the patient is not likely to recover.

In the **Hemorrhagic form** there will be severe, exhausting, hemorrhages from the mucous surfaces, especially from those of the kidneys and intestinal canal. There is apt to be sudden and severe jaundice.

There are a variety of manifestations in the various cases of this disease; usually there is a besotted expression to the countenance and the patient is careless of the outcome. The deathly coldness comes on early, with loss of muscular control. The tongue is broad and flabby, and is protruded

with difficulty. The patient experiences great distress in breathing, and the respiration is short and feeble. Later the intellect becomes confused; he lies upon his back, and slips down into the bed. There is muttering delirium, the pulse becomes weak and intermittent and flutters; the lips are drawn tightly across the teeth, the face assumes a dull leaden hue, the pupils are widely dilated, and the patient dies without reaction.

These congestive phenomena, in a less severe form, are apt to occur during the progress of severe, protracted fevers, which are complicated with malaria, in the latter stages, at regular intervals. This complication has caused the death of patients that could have been restored but for this invasion.

Treatment:—The condition must be promptly recognized. There must be no temporizing or experimenting in the treatment. If possible, the patient should be put at once into a **hot bath**, the temperature increased to the limit of endurance and sustained at that point until there are signs of a reaction. **Atropin** and **strychnin** may be given hypodermically, and other direct stimulants. The patient should be rubbed and flagellated under the water. It is a good plan to add both mustard and salt to the water in the bath in an extreme case, or a hot flush of the **physiological salt solution** may be given. In the case above referred to, the writer was called in unprepared, while passing the house, a log cabin in the woods. Availing himself of means at hand, a string of **red peppers** was thrown into a kettle of boiling water, from this, flannel blankets were wrung, cooled to a bearable point and wrapped around the patient, stripped of all clothes. Dry blankets enclosed these, and they were changed when cool. An infusion of the peppers was given internally, with diluted alcohol and tincture of belladonna. The treatment was continued for nearly two hours before reaction began.

Extreme applications or hypodermics are the most available measures, as but little is absorbed from the stomach.

Hot stimulating infusions as of **capsicum** or **ginger** are valuable.

Quinin is an important remedy as soon as the reaction has occurred fully, provided the temperature is not high. If there is any case in which large doses are permissible, it is in this first intermission. Our older writers advised the use of from ten to thirty grains at a dose at this time. I am convinced that from five to ten grains, combined with one grain of capsicum, will accomplish equally good results as the larger dose alone, with no danger of untoward effects.

The patient must be closely watched during the entire period of convalescence. The physician must be on the alert for a return of the attack on the second or third day, and again seven and fourteen days later, which must be anticipated by antiperiodics and stimulants.

REMITTENT FEVER.

Synonyms:—Bilious fever; bilious remittent fever; estivo-autumnal fever; continued malarial fever; typho-malarial fever.

Definition:—A common form of malarial fever in which the periodical phenomena are similar to those of intermittent fever, but in which, after the onset, the temperature remits only, at a given time each day but does not at any time during its continuance make a complete intermission or reach the normal point.

Etiology:—The specific cause is a malarial parasite peculiar to autumnal fevers, called the estivo-autumnal parasite. The pre-disposing causes are the same as those of malarial conditions in general. It is more active in its development in hot climates. It is milder in its manifestations in temperate climates.

Symptomatology:—The prodromata are much the same

as those of ague, with loss of appetite and marked gastric disturbance, usually. The chill is short at the onset, though often severe, the fever will last during the entire cycle, but abates usually after midnight, when there is a mild sweating stage. The temperature which reaches 105 degrees or more at its height, declines to perhaps 100 or 100.5 degrees in the mild cases, and to 101.5 or 102 degrees in the severe cases, in the early morning. The remission will continue through the morning hours. At a little before noon there is usually a feeling of depression, followed by slight chilliness and a sudden rise of the temperature which reaches its highest point usually between four and eight o'clock in the evening and remains nearly stationary until after midnight. While the fever is increasing, or high and stationary, there is severe or bursting headache, often nausea and vomiting, with restlessness, and ultimately mild delirium. There is marked soreness on pressure in the epigastrium with a sensation of oppression and distress. The spleen becomes enlarged and tender, and there are often sharp, shooting pains in the region of the liver.

As the disease increases in severity the remissions become shorter and less marked, and the chill is not distinct. As the fever abates the chill disappears, and the remissions are distinctly marked, and prolonged. In extreme or fatal cases the remissions disappear entirely and there is present a high continued fever with all its attendant phenomena and often extreme typhoid development. In the mild cases,—those terminating favorably by resolution—the increasedlly marked remission finally becomes a complete intermission, which is prolonged on each successive day, until the fever no longer appears. As the intermission is prolonged, the fever which follows is correspondingly milder, the temperature reaching three, two and a half or two degrees above normal for a period, perhaps, of two or three hours only. During the active stage, the tongue and mouth becomes dry, the lips are dry and cracked, herpes labialis appear early and persist, and if

the fever is prolonged there are sordes and other evidences of blood infection and depravation.

The tendency of all cases which have not been aggravated by the preliminary treatment, is toward a termination on the fourteenth day. Cases that are actively physicked, especially with mercury, may abate in three weeks but the usual course is five or seven weeks, if they recover.

Diagnosis:—The character of the remissions will suggest the character of the fever, and its treatment. The diagnosis is confirmed by the presence of the characteristic parasite in the blood, on microscopic examination.

Prognosis:—The tendency of this disorder in cooler climates is toward recovery. In hot climates the disease is more severe but is amenable to treatment, and the prognosis is good if gastro-intestinal irritants are not used in any form. They will almost invariably complicate the case, as these organs are in a condition of greatly increased sensitiveness.

Treatment:—The use of **aconite** and **belladonna** at the onset of this fever will be attended with excellent results in nearly all cases. Five drops of specific aconite and ten drops of specific belladonna in four ounces of water may be given in teaspoonful doses every half hour during the height of the fever and every hour or two during its remission. This course will usually be indicated by the character of the fever and the tendency to chilliness. If there is dulness of the mind, with listlessness, dull eyes and dilated pupils, irresponsive to light, delirium will be apt to follow soon, and belladonna must not be omitted. The aconite may be combined with **gelsemium** if there is much nervous excitement at any time with bright, sharp eyes. With **hyoscyamus**, if there is extreme restlessness, with some acute delirium and sleeplessness; with small doses of **jaborandi**, if the secretions are greatly reduced, the mouth and tongue persistently dry, and the skin very dry during the period of high fever.

If, at the onset of this disease, the chill is very se-

vere and prolonged, and the fever is markedly high, with extreme constitutional and nervous disturbance, in patients who have previously been robust and vigorous, a half dram of the fluid extract of jaborandi at one dose, or the hypodermic injection of one-eighth or one-fourth of a grain of **pilocarpine** will sometimes produce a complete revolution in the symptoms and abruptly abort the disease. I have had this experience and have met others who were enthusiastic at its success. The patient should be kept warmly covered in bed during the sweating stage unless it be too severe. It should not be prolonged to produce exhaustion. If, after two or three hours, the temperature falls to 100 degrees or below, three grains of **quinin** and one-half grain of capsicum may be given every three hours until the time for the paroxysm on the following day is past. The subsequent treatment will then be adjusted to the indications.

It is seldom, however, that this course can be adopted with impunity.

At the onset of the fever, if the tongue is broad and thick, and coated with a white or dirty white fur, some alkaline preparation must be administered. The soluble citrate of magnesium, the calcined magnesium, or small doses of magnesium sulphate will be beneficial if the bowels have not moved normally. Full doses of the syrup of rhubarb and potassium compound every three or four hours for the first day or two will sometimes be of much more benefit than any other agent.

Bryonia indications are usually present after the third day. These are high fever, with soreness on pressure over gastric or abdominal areas, with acute shooting pains. The aconite may be omitted when this agent is given, unless its indications are too plainly apparent, in which case the remedies may be given in conjunction, but in small dosage. In many cases it is advisable to continue very small doses of aconite throughout the continuance of the fever.

If the mucous membranes become red, the tongue red and pointed, or red at the tip and edges, with a brown coat

in the center, **baptisia** may be added with good results, or the **rhus toxicodendron** indications may appear. **Hydrochloric acid** is of service at this time. It may be given in the water the patient drinks, from five to ten drops at a time, four times daily.

After the second week, if the symptoms continue severe and show signs of developing typhoid, the rigid course advised for that fever should be adopted in the treatment of this. This is especially true if the remissions are shortened, or show signs of ultimate effacement, and the period of high temperature is increased in each twenty-four hours.

Toward the end of the first week in mild cases, or the end of the second week in favorable, well managed cases, the period of remission becomes more marked on each successive day until there will be from four to eight hours of remission with a temperature at 100.5 degrees or below. If the condition of the secretions is favorable and the irritability of the stomach has abated, the tongue moist and inclined to clean, **quinin** may be given early in the remission. I usually give one dose of perhaps three grains of the bisulphate the first day, and if it be well absorbed and there is no gastric or nervous irritability from its use, with no increase of the temperature, I would give two doses, two or three hours apart, on the second day, the first given early in the remission. With favorable results from this, the same course should be repeated on the following day. As the remission becomes more marked, and an ultimate fall of the temperature to the normal occurs, two and one-half grains of quinine should be given every three hours until the hour when an increase of the temperature above 101 degrees is anticipated. If the course is favorable the remedy can soon be continued throughout the twenty-four hours.

The restorative treatment during convalescence will be readily suggested by the indications. **Quinin**, with small doses of **nux vomica** and **hydrastis canadensis** are usually sufficient. If the redness of the tongue and mucous mem-

branes continue, with the general weakness, I have had excellent results from ten drop doses of a mixture of equal parts of the tincture of iron and dilute phosphoric acid every two or three hours in water. This gives us a quickly absorbable form of nascent phosphate of iron which is of great benefit. It may be given in alternation with the quinin and nux.

Intestinal antiseptics may be demanded. These are the sulphite or the sulphocarbolate of sodium, baptisia, and echinacea. I have given hydrogen peroxid in the drinking water continuously, with excellent results. The care of these patients should be a modified form of that advised for typhoid cases, unless the disease assumes that type, when there should be no modification, but the extreme course advised for typhoid, with prohibition of food, must be adopted. Food should be largely withheld for the first few days until the stomach irritation is allayed. Fruit juices in cold water may be drunk, ad libitum. These may be made from jellies, diluted. Later, buttermilk, whey, a raw egg, and ultimately, if progressing favorably, milk may be administered, with toast.

MALARIAL CACHEXIA.

Definition:—A chronic condition more or less general in character, which results from the persistence of the malarial plasmodium within the blood.

The pathological conditions induced from the presence of malaria are probably as persistent as those of any single cause of disease, when chronic changes have been produced in the blood and in the glandular and blood-making organs. A cachexia, when present, is usually the sequel of some of the acute manifestations of malaria which have not been influenced by treatment. It is only found in malarial

localities and in these the cachexia may slowly develop without acute primary manifestations.

Symptomatology:—As long as the plasmodium is not entirely destroyed there is apt to be a recurrence of fever. This may occur regularly, or irregularly remittent, or with periods of complete intermission. The irregular character and recurrence of the fever is the most conspicuous symptom of the cachexia; chills seldom occur, but may precede the fever irregularly for a day or two at a time; the temperature is usually not high at any time, seldom reaching 102° F.; the appearance of the skin is peculiar; it is usually tinged a dirty yellow, or yellowish brown, and is rough, harsh and dry; the sallowness increases, the conjunctivæ becomes tinged, and jaundice is finally fairly established. Enlargement of the liver is soon apparent and this sometimes increases to a marked extent, and there is tenderness on pressure over this organ, with a sensation of fulness and occasional little, sharp, cutting pains. Enlargement of the spleen is almost a pathognomonic symptom, it becomes indurated, and often tender, and occasionally the hypertrophy of this organ is excessive. With this the character of the blood changes until the patient becomes profoundly anemic, and this condition induces a further change in the color of the complexion, which may be said to be characteristic of the advanced stage of the disorder. Other blood derangements may follow and there is atonicity of the gastro-intestinal tract, with chronic catarrh of its mucous linings, loss of appetite, and marked malnutrition.

The condition which is called **masked-intermittent**, which resembles in its symptomatology the condition just described, to my mind should be included in cachexia. However, in masked-intermittent there may be no fever present, or it may recur after long, irregular intervals for a short period only, and when so occurring it may be accompanied with diarrhea or dysentery, with extreme anorexia or there may be severe headache, or erratic attacks of neuralgia. These conditions may all occur inde-

pendently of any fever, with distinct periodicity. This is especially true of neuralgia. They may be accompanied with marked nervous manifestations, as cerebral hyperemia or convulsions. Another distinct manifestation is that of hematuria, which is usually distinctly periodical in character. This is classed as **malarial hematuria**. It is much more likely to accompany the pernicious form of the disease, or to occur during a slow and unsatisfactory convalescence from that disease. Other hemorrhages are apt to occur in malarial cachexia, such as bleeding from the nose, from the gums, and hemorrhage into the retina with ecchymoses and petechiæ.

Treatment:—If the specific indications for treatment are closely observed in the acute conditions, chronic manifestations seldom occur. The results of specific treatment are nowhere more satisfactorily manifested than in malarial cachexia. The continued use of **aconite** over a period of several days, during the continuance of the irregular fever, is of service, and if the indications should not be plainly marked there are no contra-indications. When there is tenderness on pressure or deep soreness, with quick shooting pains, especially if there are evidences of the involvement of any contiguous serous membrane, **bryonia** must not be omitted. It causes a steady but satisfactory abatement of these symptoms and at the same time exercises a secondary influence upon the functional action of the liver. The underlying congestion, which in these conditions is more or less chronic, and correspondingly intractable, will be met very satisfactorily with **belladonna**.

A typical case of malarial cachexia was that of a young lady who consulted me, after nearly three years of illness in which she was confined to the bed only on very rare occasions. There was an irregular fever which had suggested the possibility of tubercular infection, in which the intermissions were seldom complete. There was anorexia, extreme lassitude, muscular soreness, and occasional violent headaches. The characteristic appearance of the skin

was present, the skin and the extremities were inclined to be cool and there was yellowness of the conjunctivæ. The stools were clay-colored, pasty, and floated upon water; there was deep soreness of the liver with occasional shooting pains. The patient implored me not to give her quinin, strychnin, calomel, iron or the bitter tonics, as she had taken them at the advice of several physicians during almost the entire period of her illness, with an aggravation only of the symptoms. She was given bryonia and belladonna for two weeks, with hot applications over the liver, and **sodium phosphate** in full doses in hot water before meals. The soreness soon abated, the temperature became normal, the skin and the tongue were inclined to clean, and after three weeks she was then given two grains of **quinin** and one-fourth of a grain of **leptandrin** every three hours. Later **hydrastin** and **capsicum** were added.

When nervous phenomena are present in this condition and the indications for quinin are present, it may be given with gelsemium with excellent advantage. The influence of both remedies is apparently heightened by combination. Prof. Locke advised an infusion of **eupatorium perfoliatum**, when in this condition there is sluggishness of every function with no reaction following even distinct remissions of the fever, with little if any perspiration, and extreme aching of the muscles and bones. He advised that the infusion be given in three ounce doses every half hour, beginning at the time the fever would increase. This after a few doses would induce perspiration and perhaps vomiting. The patient was then to be put to bed and a mild perspiration sustained for perhaps three or four hours. In any malarial condition where there is intermittent headache or severe irregular browache, this remedy will exercise a specific influence.

In the above form of *ague*, Dr. Pruitt succeeded admirably in the use of an infusion of the husks of common field corn—**maize**. He continued the remedy during all stages of the disorder. It controls the persistent temperature,

quiets irritability, and restores the functional activity of the stomach, regulates the action of the liver, and also the kidneys, and reduces enlargement of the spleen.

The old writers placed much confidence in the action of **uvedalia** in malaria, where the spleen was enlarged. Scudder advised an ointment for free external use, and twenty drops of the tincture, three or four times daily, was given internally. It is specific in congestion and chronic hypertrophy of the ductless glands, especially efficient if there be a full, sodden, inelastic, flabby condition of the tissues of the body.

A woman forty-three years of age, from protracted ague, developed extreme jaundice, with enlargement of the liver, anorexia, constipation with clay-colored feces, and great debility with ultimate emaciation, being reduced from one hundred and forty-five pounds in weight to ninety-three pounds. Edema of the feet and limbs appeared, soon followed by general anasarca. The anemia was extreme. The patient was given small doses, every three hours, of **chionanthus**, **iris versicolor** and **apocynum** in an elixir of **hydrastis canadensis**. The **chionanthus** for the hepatic congestion and jaundice, the **iris** to arouse the liver to normal functional operation, to stimulate the intestinal glandular organs and to enforce the **chionanthus**; the **apocynum** for the dropsy and to increase the power of the heart; the **hydrastis** as a tonic, both to the nervous system and to the stomach and appropriative organs. While I do not usually approve of combinations, these four remedies work in perfect harmony, with the indications here present, operating like a single remedy. After three or four weeks with this combination this patient had a syrup of the **glycerophosphates** and **strychnin**, with the **hydrastis** elixir. This completed the cure.

In gastro-intestinal disorders which accompany chronic malarial manifestations, Dr. John Fearn advises the use of **alstonia constricta**. It has cured for him atonic dyspepsia, lenteric diarrhea and dysentery. It relieves gastric and in-

testinal pain and antagonizes all the malarial processes. King cured obstinate cases of tertian fever with this remedy alone.

Other remedies which will be indicated for the hepatic and splenic complications of malarial poisoning, and which should be studied with reference to their adaptation to certain intractable phenomena in severe cases, are *podophyllum*, *leptandra*, *iris*, *chelidonium*, *helonias*, *ceanothus*, *sodium phosphate* and *magnesium*. These are certainly preferable to mercury when their specific application is thoroughly understood.

Holmes, of Florida, has observed the action of *boldo*—*peumus boldus*—in these obscure liver and splenic disorders, and claims an influence not obtained by any other remedy or combination of remedies. He claims that it relieves the toxemia, of whatever character, favors the resumption of the normal functional action of the liver and spleen, without increasing intestinal peristalsis. In five cases in which he used it with perfect results there was pain in one or two cases, resembling that of gall stone, and tenderness in the right hypochondrium, extending to the epigastric region. The skin was yellow, the urine scanty and dark, the tongue heavily coated in the center, the tip and edges red. The patients were dull, indisposed to exercise, sleepy, the pulse was about 95 and the temperature about 100° F. There was nausea and vomiting. In one of the cases the symptoms increased in severity and the temperature at times reached 105° F. *Boldo* was given in dram doses of the fluid extract every four hours, with apparent improvement from the first, and ultimate recovery in all the cases.

Other Fevers, Infectious in Character.

PARATYPHOID FEVER.

Definition:—Fevers possessing many of the characteristics of developing typhoid have long been recognized and usually classed as typhoid. Scudder uses the term synochoid to describe a simple form of continued fever. Bartholow describes the milder preliminary manifestations of typhoid, in which the patient was not confined to the bed, as ambulant typhoid. More recently, since the discovery of a bacillus differing from that of typhoid, the term paratyphoid has been applied to fevers with these various manifestations, thus placing them in a distinct class.

Etiology:—The bacilli have been found in the body fluids and in the glandular organs and their secretions. The disease occurs early in adult life and is as yet not traceable to a definite cause other than the bacillus, which occupies an intermediate position between the bacillus coli communis and the bacillus of typhoid, to which, however, it bears a closer resemblance, and is therefore called the paratyphoid bacillus. The disease is more prevalent in autumn, and, like typhoid epidemics, has been traced to infected water.

Symptomatology:—Clinically, this fever closely resembles typhoid. There is an absence of intestinal complications unless the fever is greatly prolonged. The incubation period is shorter and there is a rather sudden onset of the fever, with an immediately high temperature. Headache is premonitory and persistent, and mental dullness occurs early. There is anorexia, lassitude and debility, and often slight bronchitis.

Splenic enlargement is an almost pathognomonic phenomenon. It occurs early and is persistent and constipation usually prevails during the course of the disease. Rose-colored spots appear later, if at all.

Treatment:—In the treatment of this form of fever the indications are largely those of typhoid and are combated with the specifically indicated measures and medicines of that disease. With us the indications are all-important and the nomenclature of secondary value.

TYPHOID FEVER.

Synonyms:—Abdominal typhus (typhus abdominalis); enteric fever; ileo-typhoid; gastric fever; nervous fever.

Definition:—An acute continued infectious fever, characterized by the presence of the bacillus of Eberth. There is a constant lesion in Peyer's patches, and in the mesenteric glands and spleen. There is toxemia, diarrhea, tympanites, a rose-colored eruption and a tendency, in severe or badly managed cases, to intestinal hemorrhage and perforation. There is, following this disease, a proneness to the occurrence of acute inflammation in almost any organ, or part of the body, and local inflammation may set in during the course of this fever.

Etiology:—There is present in all of these cases a specific bacillus which was discovered by Eberth and subsequently studied by Gaffky, who confirmed the opinion of Eberth. The specific infection of typhoid is introduced, almost invariably, through the medium of the drinking water. This is more readily proven in sporadic than in endemic cases.

The role played by the house fly in the spread of typhoid is important, especially in military camps where insufficient sanitary arrangements exist. The flies have access to the excreta of the camp and also to the food supply and the epidemic is thus rapidly spread. Our volunteer camps in

the United States during the late war with Spain were striking examples of this mode of infection, which may be repeated wherever typhoid excreta is exposed, or not thoroughly disinfected, and where green grocers, milk and meat dealers and housekeepers do not properly protect their articles of food.

Predisposing Causes:—The disease occurs in youth and in early adult life. It occurs in the late summer and early autumn, especially if the summer has been hot and dry. It follows robust health, but results also from depressing causes, such as great sorrow, or mental overwork or excitement.

Symptomatology:—Typhoid fever is anticipated by a malaise, which may last for several weeks. A short time before the attack, there is severe headache each day, usually frontal, later it is of a bursting character, and it may then be occipital and increasingly severe. There is usually a tendency to dream wild, extravagant, or frightful dreams. There is anorexia, muscular aching, general dulness, and disinclination to exertion, some deafness, nasal hemorrhage, and increasing weakness. There may be nausea and vertigo, with diarrhea.

At the onset of the attack, there is a chill, though usually mild, or there may be a recurring chilliness, increasing for a few days, with heat flashes and increased headache and dulness, with some confusion of the intellect. There is, in some cases, severe muscular aching in the back and in the limbs. As the fever appears the prodromal symptoms are aggravated, with increased irritation of the gastro-intestinal tract. There is abdominal tenderness, especially in the right side, with gurgling upon pressure in the right iliac region. The temperature increases, perhaps one degree, each day and the remissions are progressively less marked. The evening temperature will exceed that of the morning, perhaps two degrees. The pulse is frequent, but usually full, large, and soft, although not always rapid. The respiration quickens and becomes short and labored.

By the seventh day usually all above phenomena will have developed fully, with increasing diarrhea. There will be from two to five evacuations daily of a so-called "pea soup" character, or they will be described as watery, clay-colored, or yellowish, frothy and of an offensive odor. Usually at the end of the first week, or often in from seven to ten days, the characteristic rose-colored spots appear on the abdomen and chest. These appear in crops, which last perhaps four days, and then fade away and disappear. They are distinct elevated papules of a rounded or lenticular form. They disappear momentarily upon pressure. There is much disagreement as to the invariable appearance of these spots. They are certainly often absent in childhood, and occasionally absent in the aged.

In marked and severe cases there may be present a scarlet erythematous eruption, or there may be urticaria or purpura, with perhaps extensive ecchymoses, abscesses, boils or gangrene of the extremities. The gangrene may be due to an obliterating endarteritis, to a thrombosis or to an embolus.

During the second week the chilliness disappears. The morning remission in the temperature is slight, the pulse increases in rapidity and is easily compressible. There may be subsultus tendinum with increasing dulness or stupor, and a mild delirium, which may occur only at night or during an effort at sleep. There is an apparent increased enlargement of the spleen and increased tympanites. The diarrhea is now difficult to control, the tongue is brown and fissured, and sordes appear upon the teeth and lips.

At the end of the second week, if the condition has not been favorably influenced by treatment, a typhomania will appear in which the patient acts as if partially asleep, his mind wanders almost constantly, and he talks as if to himself in a despondent and discontented manner on all subjects. The tongue may lose its coating entirely and become red, glossy and dry, showing extreme atonicity of the digestive and intestinal organs and weakness of the

nervous system. A bronchial irritation with a short, dry cough and bronchial rales, may now appear. The patient shows emaciation, is pale and there is a hectic flush on the cheeks.

During the third week there should be some amelioration of the symptoms, and toward the end of the week there should be a pronounced morning remission with a general slight reduction of the temperature and more mental clearness. The patient will be very weak, with a tendency to complications, and also to relapses, which are quite common at this point. Intestinal hemorrhage may now occur, especially if there be a relapse. In an unfavorable case there will be an increase of the diarrhea, with frequent dark, fetid, offensive and sometimes involuntary discharges. The coat on the tongue is almost black, there is offensive sordes on the teeth and there is marked prostration. The patient lies supine, with a constant tendency to slide down into the bed, with subsultus tendinum, and increasing coma, and, finally, death.

During the fourth week, if a favorable condition exists, all the symptoms will abate, the appetite will return and there will be a slow gain in the general strength, although there may be a little rise of the temperature during the latter part of each day for perhaps a week longer.

Diagnosis:—Unless pathognomonic phenomena are plainly apparent, a positive diagnosis of typhoid should not be made during the first week of the fever. Malarial fever, febricula, even, or remittent or relapsing fever, meningitis or the pronounced febrile symptoms, of some mild inflammation, may show some of the signs of typhoid development, and yet terminate more suddenly and more satisfactorily a little later on. The pyrexia of septicemia, of acute miliary tuberculosis, or of ulcerative endocarditis, may be mistaken for typhoid.

In a typical case there is the gradual development, languor, headache, pronounced and persistent anorexia and fre-

quently recurring nose-bleed, chilliness and persistent slowly increasing temperature.

The enteric phenomena—diarrhea, tenderness in the ileocecal region, gurgling, tympanites, splenic enlargement, especially if accompanied with dry tongue, coated brown, and an increasing tendency to sordes—will all confirm the diagnosis. The appearance of the rose-colored spots at any time will remove all doubt.

There is a consensus of opinion in favor of the clinical value of the *serum diagnosis of Widal*. The reaction has occurred in 95 per cent of the cases in which it has been used, which fact confirms its reliability. Where typhoid develops after or during the progress of some local inflammatory development, this reaction may not take place early. On the other hand, the Widal test may show the development of typhoid when its presence is not shown by other characteristic phenomena.

Differential Diagnosis:—In *acute miliary tuberculosis* there is not the peculiar development of typhoid. Although the temperature is persistently high, it has not the regular remissions, nor are there the enteric symptoms, nor the rose-colored spots. The bacilli of tuberculosis may be found by microscopic examination of the sputum. The prominence of the cough and the cyanosis will assist in a correct diagnosis of that condition.

In *septicemia* the high temperature is very irregular and there are frequently recurring chills and periods of sweating. If there be an eruption it is by no means characteristic.

Typhus fever occurs in an epidemic form and is pronouncedly severe almost from its onset. It runs a short course and has a much more abrupt termination.

Fevers of a malarial origin are difficult to distinguish from typhoid, and malarial manifestations are common during the presence of typhoid, exhibiting either the remittent or a distinctly intermittent type. Laveran's hematozoa will be readily found in the blood if present.

In *meningitis*, with the persistent temperature, which is usually lower than typhoid, there is intolerance of light—contracted pupils—marked hyperesthesia, exaggerated reflexes and often muscular rigidity before the effusion. There is vomiting, constipation and great restlessness. All the nervous symptoms are prominent in the early stage of the disorder. The distinct typhoid symptoms are usually absent.

Trichinosis has been mistaken for typhoid in its evidences of blood degeneration, with great muscular soreness, but it lacks the persistent high temperature, enteric symptoms and rose spots.

Tubercular enteritis, *tubercular peritonitis* and *tubercular meningitis* have been mistaken for typhoid, but the presence of the tubercular bacilli, with the other characteristic phenomena, and the absence of the Widal reaction, will usually readily determine the exact condition.

Prognosis:—In an uncomplicated case the prognosis is favorable, but a guarded prognosis must be given if the cerebral or enteric symptoms are distinctly severe early in the case. When a high temperature occurs early and persists in spite of the treatment, with only slight or irregular or increasingly shorter remissions, the prognosis is not good.

If a temperature of 106° F. is maintained for two or three days, the case will probably die. Where there is severe and persistent diarrhea, with increasing tenderness, tympanites and frequent hemorrhages, or where coma and marked delirium occur early, the condition is threatening. Early and persistent nosebleed is not a good symptom.

If the high temperature is of short duration and the remission long or increasing on each day a little; if the pulse is good and the heart strong and there is but little delirium and the intestinal symptoms and diarrhea seem to be readily controlled, a more favorable prognosis may be given.

Treatment:—Is it possible to abort a case of typhoid

fever when its etiological elements are implanted within the system and are enforced by a favorable environment? This question has had constant agitation for many years and is yet unsettled. There is no doubt, however, that avoidance of irritating measures, and the adoption of a rational and specifically indicated treatment, will greatly abridge the course of the disease and positively modify its manifestations in a very large proportion of cases if such a course be adopted from the onset in a positive and confident manner.

As soon as evidences appear which suggest the probability of a later positive diagnosis of typhoid, especial preparation should at once be made for the care of the **patient** in the most approved and scientific manner. These measures adopted, in a case of simpler fever or acute inflammatory manifestation, will do good and no harm, if the actual diagnosis of typhoid be not ultimately confirmed. The patient must be put to bed at once and kept in bed in a large, airy, easily heated and **easily ventilated room**, which is isolated as much as possible, and into which none should be permitted to enter but the nurses and attending physician. Both a night and a day nurse of skill and experience should be provided for the severe cases, or those which exhibit threatening premonitory manifestations. If a trained nurse is not accessible, **all orders** given by the physician should be written out in full, not alone those concerning the medicines, but those especially which concern the care of the patient, the preparation of the food, the disinfection and disposal of the excreta, and the ventilation and temperature of the room. Skillful nursing is of the utmost importance in typhoid cases.

The bed should consist of a hair mattress upon stiff springs. A thin cotton mattress over this, which can be readily changed, is advantageous. This is covered with a rubber sheet, with cotton sheet over all, changed frequently.

Any tendency in the early stages of the fever for the patient to lie continuously upon the back should be

avoided. He should be turned from side to side gently and without disturbance, and every care should be taken that bed sores do not appear.

The clothes, both of the bed and the patient, should be changed at least every twenty-four hours and as often as soiled. All soiled clothes of whatever kind should be received in a sheet that has been dipped in the five per cent carbolic acid solution. These should be boiled in the washing from twenty to forty minutes and thoroughly aired before being returned to the patient or bed. There should be two or more rubber sheets, which should be changed each day, and the one removed dipped in the carbolic acid solution, washed and dried and aired for use later.

Most important in typhoid is **disinfection** of all the excreta. This is apt to be carelessly performed. The patient should not be allowed from the first to arise from the bed, but should use a urinal or bed pan. These should be sterilized and should contain a portion of the disinfecting fluid, and more should be added after the excreta (both urine and feces) are passed. A larger vessel should be provided, into which these should be poured, more of the solution added and allowed to stand from four to six hours before they are emptied into the water closet. The total mass should be well stirred and solid particles broken up.

As disinfecting fluids, a five per cent solution of **carbolic acid** is available, or Platt's **chlorides** are of much service. A solution of **chlorinated lime** can be readily prepared by adding five or six ounces of the lime salt to each gallon of water. This is a standard authorized solution.

When it is possible to devote two contiguous rooms to the use of the patient, one can be opened wide and aired, while the patient is shut off in the other. This is of signal advantage always.

As auxiliary to our specific methods the use of water in **sponge bathing** or the **Brand method** of tub baths, is now conceded to be of much service and of great advantage.

Brand advised that the patient be kept in water at a

temperature of 70° F. for twenty minutes. This is extreme and dangerous with very young, or aged patients, or with those of previous poor health and of rather feeble reactionary powers. A temperature of 90 degrees, slowly reduced for from twelve to fifteen minutes, is cold enough for any but the sthenic cases, and with these a frequent repetition of the bath is not desirable.

I will not take it upon myself here to fully describe in detail this method, as I am an advocate of free sponging as more accessible and more readily adaptable to the individual peculiarities and necessities of the patient, and fully as efficacious, everything considered. In the sponging of a patient the water should be used at a temperature as low as possible, without producing discomfort to the patient. A little **alcohol** or **ammonia** may be added to the water, or 30 grains of the **ammonium chlorid** to the pint of water, may be used instead of water alone, two or three times daily. The arms, head and neck, legs, and then the trunk should be sponged in the order named, and each partially dried in succession before proceeding to the next. The sponging should be resorted to whenever the fever is on the increase and above 102° F. The sponging should be continued until the temperature has fallen from one and one-half to two degrees. If the patient becomes chilly or restless it should be discontinued. If it is decidedly opposed by the patient because of results unpleasant or distressing to him, it should be avoided entirely, except as applied to restricted localities.

In my earlier practice I became familiar with the application of the **wet sheet pack** at the onset of fevers and inflammations, and there is no doubt of the great efficacy of this method in the developing and early stages of typhoid. The temperature of the sheet may be adapted to the sensations of the patient. It may be cool, cold, at the body temperature or even hot, as the patient prefers. If applied hot the outer wet surface of the sheet should be exposed to the air until it cools to a point as low as desired, when the

whole should be wrapped in a dry blanket. The patient may remain so wrapped for an hour, and will experience only comfort and rest. A perspiration often starts and may continue for some time. The patient may fall into a restful sleep in the pack, when extra covers should be applied to assist normal reaction and prevent too great depression. The sheet may be applied during the first week as often as every four or six hours and continued from half an hour to an hour, or even more. This method is readily adjustable to both the very young and the very old, with great benefit. Its application demands caution, and the exercise of the best of judgment.

In the **feeding of typhoid patients** many factors are to be taken into consideration. The extreme inactivity or actual suspension of operation of the digestive and assimilating functions makes the question of nutrition one most difficult of solution. From the onset of the fever solid foods in any form should be proscribed, and **milk alone**, always diluted, and usually with a trace of salt added, is the safest article of diet. Of this, from thirty to sixty ounces should be given within each twenty-four hours, and if there is any question of its digestion it should be prepeptonized. I have found patients, notably those where acids were indicated, where **buttermilk, matzoon, or kumyss**, suited the stomach better than milk in other form.

John Uri Lloyd has written some excellent articles on the food value of water, and there is no doubt, that with the reduction of the temperature—the lessening of the total number of hours of high temperature—there is a tonic, a strengthening effect from the free use of water both internally and externally.

During the course of a severe case of typhoid fever, especially if it be greatly protracted, there may be a time when the ingestion of food of any kind apparently does harm. There is increased nervous and intestinal irritation, a marked and sometimes abrupt rise in the temperature, and often delirium and increased diarrhea and tympanites.

These conditions make it imperative that all food be discontinued, but water should be freely given. This course is now adopted by the leading clinicians. It is surprising how much benefit will obtain in even prostrate cases if this course be carried out for a few days. Later, as a substitute for solid food, I have obtained good results from the use of **fruit juices** prepared with the least possible amount of sugar. Where the juice from the fresh fruit cannot be obtained I have used diluted jellies. A teaspoonful or two of jelly may be added to a glass of water, which may be prepared as I have specified, with peroxide of hydrogen, and drunk ad libitum. It is very acceptable to the patient, does not disturb the stomach even in sensitive cases, does not ferment in the stomach, and shows evidences of considerable nutritional power.

Where there has been hemorrhage or where this condition threatens, it becomes necessary sometimes to substitute **nutrient enemata** instead of food per os. For these enemata, **hot milk** containing a little salt may be used, or an ounce of **cream** every three hours, or half an ounce of **bovinine**. Later, when the stomach will receive food, the white of an egg, dissolved in water, may be given in frequently repeated small doses, or where the prostration is very marked, and nutrition seems imperative, finely scraped **raw beef** may be administered. When the case has not assumed a severe form, and convalescence occurs early, or where we have reason to believe that the ulceration in Peyer's patches has not been severe, the patient may take the **entire egg** diluted, or thin **custards**, or may eat a little well cooked **rice**.

I have found **ice cream**, prepared by the nurse, of fresh milk with a very little corn starch and a minimum of sugar, with eggs if desired, to be received by many patients most gratefully, and to cause but little disorder of the stomach. This I have ordered administered quite freely during the high temperature, but always given in small quantities, and allowed to melt in the mouth.

When convalescence does not occur until the patient is greatly exhausted, the administration of **eggs** and **raw meat**, as above specified, is often of great service. Solid diet should be returned to very gradually and always with the advice of the physician. Some patients, for a beverage, do well upon the use of a little coffee or tea, and if the indications for an acid are present, **lemonade** or **orange juice** given cold and sweetened with a little glycerine will be of much service.

A thorough **cleansing** of the **mouth** and throat with a saturated solution of **boric acid**, or better yet, a strained infusion of **white oak bark** containing twenty grains of boric acid and ten drops of **echinacea** to the ounce should be frequently made day and night. If a little **glycerine** be added to the solution it will be gratefully received, if the mucous membranes of the mouth, and the tongue be dry and parched. The patient should be encouraged to drink freely of pure **cold water** throughout the entire course of the fever. If a tablespoonful of the **peroxide of hydrogen** be added to each quart of water without the patient's knowledge, there will be no taste of it in the water, and its influence as an oxidizing and disinfecting agent, steadily and persistently administered, will be of the most signal service in preserving a benignant form of the disease, and in its ultimate abridgement. The use of a mild infusion of equal parts of **marsh mallow** and **epigea repens** or **triticum repens**, to which a little lemon juice is added, drunk cold, will be very pleasant to the patient and will act as a most serviceable diuretic.

The use of **alcoholic** stimulants in the earlier stage of typhoid is often **harmful**. The commonly accepted opinion that stimulants are necessary from the first is radically wrong. Stimulants are indicated by exhaustion, and need not be given until the indications appear. Then a little good **wine** or diluted brandy can be given during that period when the temperature is the lowest, but I am positive that harm results when given during the increase

of temperature. We have recourse to remedial agents that are in every way superior to alcoholic stimulants. These will be named in their proper order.

When in convalescence fever has been absent about eight days the ordinary diet may be very gradually resumed, due attention being paid to the manner in which the food is received within the gastro-intestinal tract. Fresh vegetables have an especially rapid restorative influence when well digested, and fresh fruits in season are acceptable. The administration of an artificial digestive with the first solid food, and for the first few days, is an important precautionary measure.

Medicinal Treatment:—It may be well to preface the suggestions to be here made, with a caution concerning a **fallacy** which the profession has been in the habit of adopting in the past. A most notable error is the inauguration of the treatment of typhoid with the administration of an active dose of physic, and the continuation of laxative remedies during the course of the treatment. I am confident that the profession at large makes no greater mistake than this. Let good judgment and a keen rational discrimination decide as to whether intestinal obstruction from any cause or fecal accumulation be present. If these exist, a mild laxative, accompanied with a large high enema, will be sufficient in all cases. In an observation of nearly thirty years I am convinced that large doses of calomel invariably prolong the fever, and that this foreign substance in any dose may be readily substituted by a rational organic remedy. The old practice of administering a severe emetic at the outset of the disease has become obsolete, although the stomach must be freed from any indigestible material.

The first consideration in every case must be the reduction or the restraining of the temperature. In sthenic cases, at the immediate onset of the disorder, if there be a pronounced chill, with greatly elevated temperature, of abrupt occurrence, and especially if there be, as sometimes occurs, a wild delirium, within the first few hours, it is ex-

cellent treatment to administer a full dose of **jaborandi** or one-twelfth of a grain of **pilocarpine**, hypodermically, to put the patient into a **hot bath** for a short time, and then wrap him in blankets and encourage profuse perspiration. I am confident I have seen cases aborted or greatly abridged by this course. The sudden early occurrence of violent delirium in the sthenic stage has no better remedy than **jaborandi**.

It is seldom, however, that the physician is called until the fever is well established. If there be a dark, flushed face, with full capillary circulation, a rapid, large, full pulse, **veratrum** should be given in small doses every hour as long as this condition is present. But this is apt to change quickly. The skin will become dry, the face flushed bright red, the mouth dry and parched, the pulse smaller and hard, yet rapid. These indications demand **aconite**. Of the specific remedy, five drops in four ounces of water should be administered in dram doses every hour. This agent in rather full dosage during the sthenic stage is of much benefit and I am satisfied that in very minute dosage it may be continued into the asthenic stage with only good results in its restraining influence upon high temperatures and in assisting the dissipation of heat. If there be with these later indications a great degree of nervous excitability, with contracted pupils, and muscular twitchings, **gelsemium** may be given with the aconite or may be substituted for it.

I am confident that **belladonna** is a remedy of rare value in certain cases during the first two weeks of typhoid fever. The specific indications are dulness of intellect, cool skin or cold extremities, sluggishness of the capillary circulation and dilating or dilated pupils, but I have administered the remedy when these indications were not marked, in very small doses of the tincture, combined with aconite, and obtained excellent results. It prevents local congestion and stasis in the intestinal glands and equalizes the circulation.

The **coal tar derivatives** have no place in the treatment of this disease. In minute doses no results are apparent, and in large doses the destructive influence of these agents upon the red blood-corpuscles and in forming methemoglobin overbalances any beneficial effect their depressing influence may have upon the temperature.

Bryonia has an important place in the treatment of all stages of typhoid. Whenever there is deep tenderness on pressure, sharp, quick cutting pains, or evidences that the peritoneum is involved, this remedy will control the temperature and will exercise a beneficial influence upon the inflammatory processes. Homeopaths use this remedy in the treatment of the fever during the period of prostration—the asthenic stage—and obtain excellent results. I think if the dosage be small enough it may be given in alternation with aconite, but the dynamic rather than the physiologic action of both agents must be sought for. During this stage **rhys toxicodendron** is a remedy of value. The sharp, burning heat in the skin, with circumscribed bright red spots upon the cheeks, with sordes upon the teeth, the tongue and mucous membranes dry and red, the eyes bright and restless, with the presence of tympanites, all demand this agent. If the tongue be bright red with a pointed tip upon which the papillæ are elongated and pointed, this agent will be of direct benefit.

Arnica is indicated in those cases where the nervous system is greatly at fault—is greatly depressed. It increases the nerve force, adds strength to the heart, slows the pulse and reduces the temperature. It is especially indicated where, from extreme depression, there are frequent involuntary discharges. Where there is low, muttering delirium, the tongue dry and parched, and the throat apparently clogged with foul, stringy mucus, it is demanded. It stimulates the respiration and promotes the oxygen carrying power of the blood. It increases nerve sensibility, overcoming paresis. It acts upon the secretory function of the skin and kidneys in a satisfactory manner. The dose is

small—from five to fifteen drops in a four-ounce mixture is given in dram doses frequently.

Much is said concerning the desirable influence of **digitalis** in typhoid fever. When this agent is studied in comparison with **cactus grandiflorus** and the latter remedy is understood in all its bearings, it will be found that cactus is superior to the better known drug. Cactus increases the musculo-motor energy of the heart, increasing its action, and seems to supply nutrition to the central nervous system. It stimulates the heart from actually increased nerve tone, through improved nutrition of the entire nervous and muscular structure of the heart. It does not whip up the heart only, as digitalis and strychnin do, but adds tone. It produces no gastric irritation, and being non-toxic, is harmless in any dose. Its influence, therefore, in the extreme prostration of typhoid is most salutary. It also prevents heart complications and relieves the strain which the persistent high temperature and increased activity of the circulation throw upon this organ. Through this influence it certainly restrains the temperature. When typhoid or other protracted fever has produced dilatation of the heart we have no better remedy than cactus.

I have administered the **phosphate of iron** in trituration at the period of the highest temperature each day in these fevers, with good results. I have dissolved ten grains of the third decimal trituration of ferrum phos. in a teacupful of boiling water, and administered this in teaspoonful doses every ten minutes during a period of two or three hours in each twenty-four hours of the first week or ten days, when the temperature was the highest, discontinuing all other remedies while this was given, and have seen most desirable results.

Hemorrhage is almost an unknown complication with those who have used echinacea in typhoid. If it occurs it is treated with astringents according to its indications. A full dose of **ergot** will sometimes exercise a wide influence of much value over the entire circulation, or if hemorrhage

is anticipated this agent may be given in from five to ten minim doses every three hours with great advantage. Its influence upon the central nervous system is most salutary if there be a tendency to dulness or coma. **Hamamelis**, **thuja**, **collinsonia**, **erigeron**, **capsella** or **aromatic sulphuric acid** or **nitric acid** are often most serviceable remedies selected according to their specific indication. In extreme passive hemorrhage **gallic acid** is important, especially if hematuria be present.

The **delirium** must be treated directly. I have observed that but little benefit from any other treatment will occur while delirium exists. For this condition **hyoscyamus** is of much value in the excitable or wild form. It may be given with confidence. It may be given alternately with ergot or gelsemium if determination of blood to the brain be plainly apparent.

Ergotin granules are a form most convenient of administration. In extreme **stupor** with subsultus tendinum I have obtained the best of results from **hydrobromic acid** fifteen minims and ergot ten minims every two or three hours persisted in until the condition was overcome.

The **bromides** and **chloral** in consistent doses will be found of service in the **insomnia** and restlessness of typhoid. **Hyoscyamus**, **passiflora** and **cannabis indica** are also of much value.

Diarrhea will not prove a serious complication if no active physics have been used and if the bowels be freely flushed after each large movement a few times, with an antiseptic flush. **Geranium**, **epilobium** or **erigeron** in sufficient doses will usually control excessive action. Thorough irrigation of the colon with the **physiological salt solution** to which are added a few drops of **carbolic acid**, will control the diarrhea, remove existing tympanites effectually and restore to a degree the strength of the patient, increasing the force and volume of the pulse.

Quinin has no place in typhoid as a specific antipyretic, but in those cases where malarial manifestations are pres-

ent as a complication it may be given in the early stage of convalescence only at that period of each twenty-four hours when the temperature drops below 101° F. And it must be discontinued when any apparent nervous irritation appears from its use. The **bi-sulphate** should be given in preference to the sulphate because of its ready solubility and absorption. This agent may be continued with the tincture of iron as a tonic throughout the twenty-four hours when the temperature is normal and the secretions are restored. Other restorative agents are **nux vomica**, **strychnin**—preferably the **strychnin arsenate**, **hydrastis**, **phosphorus**, or the **glycero phosphates**, **bovinine**, the **hypophosphites** and **cod liver oil**. I have combined the tincture of iron and **dilute phosphoric acid** and given full doses of this with small doses of quinin with good results. Other tonics will suggest themselves to the experienced physician as directly indicated.

Antiseptic Measures:—While typhoid is an infectious disease and while we believe the bacteria act in the intestinal canal upon Peyer's patches, we do not get the pronounced direct results from intestinal antiseptics we would anticipate, because the bacilli and the resulting toxins are not active upon the surface of the mucous membranes, and after the bacilli penetrate the structure of these membranes, they have passed beyond our reach, and this before the fever appears. Much good is accomplished by this class of agents in preserving an antiseptic condition of the gastro-intestinal tract.

I have mentioned the persistent use of **hydrogen peroxide**. I would further advise its use in all enemas and especially when diarrhea is present. Systematic and thorough lavage of the intestinal tract is an important feature of the treatment of typhoid. Two tablespoonfuls of hydrogen peroxide in each quart of water after each bowel movement cleanses the lower intestinal canal and assists in controlling further bowel movements. This is especially true in typhoid also. If this condition be severe, a half dram of the

spirit of turpentine should be mixed with the water and injected once each day.

Echinacea has been extensively used in the past ten years, and while it has not aborted the fever, it is the best of our agents in antagonizing the influence of the toxins within the system. It may be given in conjunction with all other indicated remedies in from five to ten drop doses every two hours. All observers unite in the opinion that it greatly modifies the severity of every case. It lessens the fever and materially shortens its course. But few cases continue beyond three weeks when this agent is used. It preserves the integrity of the blood, sustains the action of the heart, stimulates the stomach, encourages nutrition and positively wards off complications and sequelae.

Baptisia is indicated when the tongue is dry and coated with a brownish coat; when the mucous membranes are dark colored, purplish or dark red and when the breath and fecal discharges are fetid and there is sordes on the teeth. It is a great favorite with those who have had experience with it. It should be given as soon as these indications appear.

The **sulpho-carbolates** have an important influence when there are evidences of sepsis and decomposition of undigested food substances, especially if the mucous membranes are pale, the tongue broad and thick and coated white. The **sodium sulphite** is administered at this time with good results also, especially if the coating on the tongue be dirty or yellowish white. The indications for **acids** in typhoid are plainly marked in most cases, but **hydrochloric acid** is of benefit in its influence upon the stomach and digestion when the usual indications of a deficiency of acids in the system are not plainly apparent. When the mucous membranes are deep red, and the tongue has a slight brown coat, or a dry brown stripe down the center, this agent is indicated. But it may be given diluted after the food when there is extreme prostration at any time if the body of the tongue be of a deep red or even

if there is a whitish fur on the tongue, or if the papillæ are greatly elongated and tipped with white. It is especially serviceable in the early stages of convalescence.

Turpentine is a remedy of importance when there is marked deficiency of the secretions of the mucous and glandular organs of the intestinal tract, with tympanites. If the tongue be very dry and pointed and dark colored it may be given in an emulsion every two or three hours in doses of from two to five minims. It may also be applied in the form of a stupe, externally. From half a dram to two drams stirred thoroughly into an enema of very warm water and introduced through a high rectal tube will remove the accumulated flatus in tympanites and give immediate relief.

TYPHUS FEVER.

Synonyms:—Ship fever, putrid fever, camp fever, jail fever, exanthematic typhus, hunger typhus.

Definition:—An acute highly infectious self-limiting fever. It is characterized by the suddenness of its onset and by the development of a petechial eruption, general in occurrence and not recurring in crops, like the rose rash of typhoid. The temperature is high from the first, with marked nervous phenomena.

Etiology:—A specific cause for this disease has not been determined. The methods of its conveyance are not known. It is seldom found except among emigrants and sailors in seaport towns. There has usually been immediate, intimate contact with the sick, under circumstances of filth, bad hygiene, poor ventilation, impure drinking water and poor food, restricted in quantity—conditions of poverty and overcrowding. It is not strictly a water borne disease, as typhoid fever appears to be.

It occurs most frequently among young adults and in

early middle life, because these are more apt to expose themselves to the essential conditions.

Symptomatology:—The disease requires ten days for its incubation, during the last two of which there is usually general malaise, indisposition and loss of appetite. The occurrence of a severe chill, or a series of light chills, is suddenly followed by immediate prostration, severe muscular pains, headache, tinnitus and vertigo and an almost immediate high temperature, which reaches 104° F. on the first day, and 105° F. on the second day, and persists with no regular remission. There is nausea and vomiting, sometimes most persistent. The tongue is coated with a thick, dirty, yellowish white coat, there is great thirst, but scanty urine of a high specific gravity.

The **Nervous Symptoms** are often pronounced from the first. With the appearance of the fever there is delirium, which may quickly become active, and as quickly, later on, assume a violent maniacal form, or assume the form of a typhomania. Coma and comavigil quickly follow, the patient profoundly unconscious, yet staring into space with widely opened eyes. There are tremors, carphologia and subsultus tendinum. The face then assumes a dull, expressionless, even stupid appearance, the bright flush assumes a dull, dusky purplish hue, and evidences of the most extreme prostration, tending to complete exhaustion, are plainly apparent, the patient sinking down in the bed in the dorsal position.

About the third day of this serious disease, but often delayed twenty-four or thirty-six hours, a rash, which is characteristic of the disease, appears upon the abdomen first, and then extends to the chest and extremities, seldom appearing upon the face. This quickly assumes the form of a rose-colored eruption. There is no abatement of the temperature, but frequently an increase of the febrile phenomena. The pulse becomes rapid, feeble and irregular. The red spots become darker in hue, are hemorrhagic or petechial, and they coalesce, causing the skin to assume

a spotted or mottled appearance. The tongue becomes brown and is dry, fissured and tremulous, and the teeth are covered with sordes.

On the fourteenth day there is usually a sudden rise of the temperature, and the crisis occurs. The decline of the fever is quite rapid, although marked with some exacerbations and irregularities.

Complications and **sequelæ** are not as common as with typhoid fever. The vomitus in some extreme cases may consist principally of blood. The heart shows progressive weakness. The lungs and bronchi are the most commonly affected, as broncho-pneumonia, bronchitis or hypostatic congestion may be induced. **Hematuria** has been found to occur in extreme cases and **meningitis** and some mild forms of local **paralysis** are not uncommon.

Diagnosis:—The presence of an epidemic of this disease suggests its probable character. The character of the eruption is pathognomonic. It is distinguished from typhoid fever by the sudden rise of extreme temperature and absence of regular remissions, also by the absence of enteric symptoms. It is distinguished from cerebral inflammation or from cerebro-spinal meningitis, by the character of the headaches, and by the convulsions, and absence of a similar eruption, in the latter.

Prognosis:—The prognosis of this disease is not necessarily unfavorable, but depends upon the severity of the epidemic, and the previous condition and age of the patient. The mortality rate is perhaps fifteen per cent.

Treatment:—The patient must be placed at once in a condition which is in every way hygienic. Nutritious feeding can be persisted in without the danger present in typhoid, and this should receive much attention because of the immediate and severe prostration. As there is no danger of intestinal irritation and possible inflammation, a thorough, effectual laxative will be of much service, and if the prostration is marked, an enema, or a pint of physiological

salt solution should be then given and retained, every three or four hours.

In unquestionably sthenic cases a hypodermic of pilocarpine, one eighth of a grain, may be given early. If marked delirium occurs quickly with the sudden rise of temperature, a sitz bath in hot mustard water, until the skin is markedly reddened, with a sharp mustard paste to the entire spinal column, should precede other treatment. These positive measures often abort the disease or abridge its severity. If the temperature has reached an extreme point, when first seen by the physician, the patient may be wrapped in a sheet wrung out of water of about eighty degrees temperature; with cold cloths to the head. If the patient complains of the increased heat, the sheet may be removed after a time and reapplied at the original temperature. It may be kept on for two or three hours or until there is a reaction and some perspiration.

The further treatment of the disease should be guided by the indications, all of which will be met by remedies advised for typhoid and the same general and specific rules for their application may be followed here. A radical course, calculated to jugulate or abort the disease, should not be adopted after the third or fourth day. A steady impression should be made then upon the dominant conditions by the specifically indicated remedy. The indications for **aconite**, **belladonna**, **rhue toxicodendron**, **baptisia**, **echinacea**, **hyoscyamus**, the acids or alkaline remedies, when they appear, will all be pronounced for one or more of these remedies. **Hydrobromic** acid will be found serviceable for the delirium, but **ergot** must be given with caution, because of the deficient power in the capillaries of the skin. **Belladonna** will serve the purpose of **ergot** to a much better advantage.

The upbuilding of the patient will need more stimulants at first, than typhoid, but nutrition can be forced, with good judgment, almost through the entire course of the disease. The physician must watch for the crisis; must attend in

person, and guide the patient safely through this most critical period of the entire course. Inattention or negligence at this time may render all previous good care unavailing.

RELAPSING FEVER.

Synonyms:—*Febris recurrens*, relapsing typhus, spirillum fever, famine fever, seven-day fever.

Definition:—An acute infectious fever, marked by regularly recurring abatement and relapses, and caused by the presence in the blood of the spirillum or spirochæte of Obermeier.

Etiology:—The disease occurs more frequently where there is great destitution and in filthy and unhygienic localities. A larger proportion of males is usually affected. It is most common between the ages of fifteen and twenty-five years. In 1873 a special organism was found by Obermeier in the blood of these patients, and subsequent observations have proven that these germs exist only during the paroxysm, and at this time inoculation with this blood will reproduce the disease. They disappear entirely before the crisis and are absent during the apyrexial period. Inoculation at this time does not induce the disease. These organisms are in the form of a spiral filament about five times as long as the diameter of a red blood corpuscle. It rotates actively in the blood during the fever. It is found in none other of the body fluids.

Symptomatology:—The period of incubation is from five to ten days, but there are few prodromata. The invasion is abrupt and unannounced. A chill usually occurring early in the morning before the patient has arisen is the first announcement of illness. This is sometimes rigorous, at others there is a succession of light chills. Immediately there are pains in the loins and in the limbs. There is severe frontal headache, vertigo, nausea and vomiting and

physical prostration. The temperature rises rapidly and by night of the first day it may reach 105 degrees. The face is flushed and the eyes are sunken, but not dull and expressionless, as in typhoid. The skin is dry and harsh, and on the second or third day presents a slightly jaundiced, a characteristically dirty yellow or bronzed appearance. There is no constant characteristic eruption, but because of profuse perspiration sudamina may appear, and small petechiæ or ecchymoses. A peculiar odor is sometimes observed.

Constipation is present usually at the time of the invasion, and persists; there is thirst, loss of appetite and a substance, greenish yellow or black in color, mixed with blood and the gastric secretions, is vomited.

With the rapid rise of temperature the pulse also rises to from 120 to 140 beats. It is full, strong and regular for the first day, but rapidly loses strength and character, becoming irregular and intermittent. The headache persists, but delirium is not pronounced, if present at all, the intellect remaining undisturbed, though there may be restlessness and insomnia. There is rapid respiration which, just preceding the crisis, may become difficult. The spleen and liver may both be enlarged and tender, and lung or bronchial complications may occur.

The temperature usually attains its highest point on the second day, sometimes reaching 107 degrees, usually, however, not rising above 105 degrees. A rather regular uniformly high temperature is maintained for from five to seven days, when, with a premonitory sudden increase in the temperature for a short time, it then falls, often within twelve hours to the normal point or below. With the decline of the temperature sweating begins and is sometimes extreme for a short time, or in its stead a profuse diarrhea or an intestinal hemorrhage or epistaxis or a metrorrhagia in women occurs. There is then an immediate cessation of all symptoms, and within forty-eight hours the patient is apparently in his usual health.

There are, however, slight recurrences of temperature in the evening, and the peculiar appearance of the skin remains. After four or five days, without change, there is another chill and all the phenomena of the first attack are reproduced. This attack leaves the patient with an enlarged and tender spleen and increased weakness. The second attack is usually the worst of the series, which may consist of two, three, four or five, all similar, but decreasing in severity after the second, with perhaps a slightly lengthened interim.

Complications and Sequelæ:—Rupture of the spleen has occurred in these cases. In pregnancy abortion is induced. Pneumonia follows also and epistaxis is not uncommon and hemorrhagic nephritis, while marked icterus, hematemesis, uremia and sudden collapse should be looked for in extreme and protracted cases.

Differential Diagnosis:—The disease may be distinguished from typhus by the eye and skin symptoms. Yellow fever has a shorter and less marked, less complete, remission, and the jaundice is intense, with black vomit in the collapse. The blood will show the characteristic spirochæte, which will be confirmatory.

Prognosis:—This depends upon the number of the relapses. Ordinarily there are but two exacerbations, and in these cases the course of the disease will terminate within twenty-one days.

Treatment:—The phenomena should each be dealt with similarly to those of typhoid and typhus. The indications for specific remedies will be very conspicuous. Anticipating splenic enlargement **polymnia uvedalia** should be given in small doses from the first with whatever fever remedy is suggested. The indications for **bryonia** will occur more frequently on relapsing than in typhus fever. **Aconite** is often indicated in the first stage of the disorder as is **belladonna** and perhaps **rhus toxicodendron**. If called when the temperature was running a steady high course I should advise the phosphate of iron persistently in minute doses, as

suggested for high temperatures in my *Materia Medica*. I have had surprising results from this remedy. During the intermission the following should be given, a capsule every three hours, if the stomach will permit:

℞ Quininæ bi-sulphatis	℥i
Hydrastinæ	gr. xv
Ext. nucis vom.....	gr. v
Pulv. capsici	gr. vi
M. ft. capsulæ No. xx.	

Give one capsule every three hours, preferably after eating a few mouthfuls of bread or a small cracker. This, with well selected diet, the patient remaining in bed during the time of the intermission, will often ward off the first relapse and abruptly terminate the disease. More care should be taken concerning the diet than in typhus because of the hemorrhagic tendencies of this disorder.

GLANDULAR FEVER.

Definition:—A mild acute fever, infectious in origin, characterized by an adenitis involving the cervical glands. It is common in childhood, occurs less often in youth and few cases have been observed in adults.

Etiology:—Immediate infection is the undoubted cause of all epidemics, as it has attacked several members of the same family. No specific micro-organism has as yet been isolated, consequently the exact cause of the disease is unknown.

Symptoms:—General malaise, headache, restlessness, aching and pain in the limbs precede the sudden appearance of fever. The temperature varies from 101° to 103.5° F., usually not exceeding 102.5° F. Among the early symptoms are stiffness of the muscles of the neck, with consequent immobility of the head, largely from pain. Nausea, vomiting and a degree of constipation are present, although

in one epidemic in severe cases there was an acute intestinal catarrh with large watery greenish discharges. Acute colicky pains in the abdomen are not uncommon. The involvement begins with enlargement of the glands on the left side, usually on the second day, followed a day or two later by enlargement on the right side. The glands are very sensitive to the touch and painful on movement. The tonsils are usually enlarged. In some cases other glands become involved, notably the liver, spleen and kidneys. An acute nephritis becomes a serious complication in an occasional case.

The febrile reaction remains for from seven to ten days. The period of glandular enlargement usually lasts from fourteen to sixteen days. Suppuration and sequelæ are rare.

Prognosis:—It is seldom that a case results seriously, and convalescence is rapid and uninterrupted.

Treatment:—At the onset **aconite** in small doses and **phytolacca** are directly indicated in all cases. If the tongue and mucous membranes are pale and the tongue is coated white, a small dose of **sodium bi-carbonate** should be given and repeated in two hours. A mild **alkaline aperient** may be needed or a few doses of **neutralizing cordial**, but the **phytolacca** must not be omitted. An initial dose of five grains of the **potassium acetate** in a small glass of water is sometimes of much value. The local application of **anti-phlogistine** or a **phytolacca ointment** will quickly relieve the pain. Hot applications are beneficial. The food should be simple and nothing acid given. Other indications will suggest specific treatment.

ACUTE ARTICULAR RHEUMATISM.

Synonyms:—Rheumatic fever; acute rheumatic fever; inflammatory rheumatism; acute rheumatism.

Definition:—An acute constitutional disorder, due to general infection, characterized by a sharp high fever and by an acute local inflammation, with the usual concomitants of pain, heat, redness and swelling of the enveloping tissues and synovial membrane of one or more of the joints of the extremities. It is usually sporadic in its appearance and is not considered contagious. Occasionally an epidemic is suggested by the coincidental appearance of a number of cases in one locality.

Etiology:—The exciting cause of the disorder has not been positively determined. The investigations of Poynton and Payne, confirmed by Walker, Meyer and Beaton, point strongly to the existence of a specific micrococcus, but that this germ is distinct from the streptococcus is not fully proven. The uric acid theory of the cause of the disease is no longer accepted.

The predisposing causes are many. The season and the weather exercise the most apparent influence. The disease is one of cold, damp weather, appearing often in the late fall, but most commonly in the United States in the early spring months or from the middle of February to the middle or last of April. It occurs occasionally in times of extreme rainfall, even if that be during the hottest weather of midsummer. Foreign authorities claim that it is common in extreme dry weather. This is not observed to any great extent in our country, although isolated cases in dry weather are not uncommon. Exposure to cold, with wet clothes, predisposes directly to the disease. Parties working in wet places or with the feet or clothes constantly wet are especially liable to it. The disease very seldom occurs in infancy, but an occasional case will be seen under five years of age. From the age of five to twelve years it is more

common, and more frequent among girls than boys, and these cases are very susceptible to cardiac inflammation, more than seventy-five per cent of which are so complicated. Between the years of twelve and thirty-five it is most common and at this period among men rather than women, as their occupation exposes them to the peculiar causes of the disease. Attacks of tonsillitis predispose the patient to rheumatism, it frequently following that disease immediately. It is so frequently associated with endocarditis that some pathologists claim that the two diseases depend upon the same specific cause. Cases suffering from chronic endocarditis are especially liable to rheumatism, and inversely very many cases of endocarditis follow rheumatism or are coincident with it. This disorder is also apt to occur in children suffering from chorea. In other isolated cases a child who may have suffered repeated attacks of tonsillitis has chronic rheumatism with valvular murmurs in the heart, and at the age of from eleven to fourteen years may develop stubborn and intractable chorea. There is certainly a causal relation between these disorders which is not as yet explained. An attack of rheumatism confers no immunity against future attacks.

Symptomatology:—There is no definite period of incubation in rheumatism. The milder cases occasionally develop somewhat gradually, with **malaise**, **muscular soreness**, and perhaps some tenderness in one of the joints. Typical cases, however, may occur with no premonition. The patient is aware of having been subjected to undue exposure, but no symptoms are present, except, perhaps, those of an ordinary acute cold, when suddenly one of the **joints**, most commonly the ankle or knee, becomes extremely **painful** and swells rapidly and excruciating sensitiveness with redness develops. Every movement and even the most careful handling causes **extreme pain** and prevents examination in diagnosis. The **local heat** seems intense, and the redness soon becomes somewhat dusky in color. Simultaneously a **chill** occurs and fever is found to be present, which in-

creases with the increase of the local evidences. The **temperature** seldom rises above 102.5° F. and it is subject to irregular remissions, during which the patient will sweat profusely. During the increase of the temperature the skin is dry and hot and the patient moans and is restless and fretful. The patient is never "comfortably sick" in rheumatism. The fever may terminate by lysis in seven days, but its course is uncertain and extremely irregular. Some of the severest cases terminate within a few days most satisfactorily; other milder cases may continue even for months. In yet other cases there may be a remission of the fever, with complete abatement of the local symptoms at the original point of attack, when the acute inflammation will abruptly develop in another joint previously unaffected. This may occur until all the large joints of the body have been attacked. In other cases two or more of the joints may be inflamed at once. The disease may attack a solitary joint and no abatement occur in this locality, when another joint is attacked, and this continue until one by one several of the larger joints will be involved to a greater or less degree; or the inflammation may recur in a joint which was previously affected. The order of the invasion of the joints is not regular, but usually the knee and ankle are first involved, with perhaps the wrist, then the shoulder, elbow and hip joints. The phalangeal joints are next in order, then the tarsal and metatarsal joints, the intervertebral articulations, and ultimately the ribs, the sternoclavicular articulations and those of the jaw. Ankylosis is not a usual result of acute uncomplicated rheumatism.

With the progress of the fever the **pulse** is soft, full and round and about 100 beats per minute. In cases where the constitutional symptoms are severe and the nervous irritation is marked, the pulse is irritable and more rapid, and where pronounced **blood changes**, which are not uncommon, occur, the pulse may be very feeble, irregular and rapid. Where the **heart** is involved the character of the pulse is correspondingly influenced. Copious perspiration may ac-

company rheumatic fever, so much so as to demand special medication.

There are occasionally cases of **hyperpyrexia** in rheumatism which should be appreciated and combated. The **temperature** may rise abruptly, even at 106° F., with great restlessness, nervous excitability and convulsive phenomena, or there may be marked **delirium** and increasing dulness and stupor. This, however, is rare. Cases with the above phenomena are complicated and are apt to terminate fatally. **Insomnia** is a common complication during the entire course of this disease, and is in part due to the persistent distress. The **kidneys** are fairly active, but the urine is concentrated, of small quantity and of very high specific gravity, and it is of pronouncedly acid reaction. Urea, uric acid and the urates, with occasionally the phosphates, are present, all in great excess. A little albumin is often present, which I have attributed more often to the irritation and consequent congestion caused by the elimination of the concentrated solids than to faults in blood pressure. These faults occur, however, to a pronounced extent when heart complications arise and their seriousness is in proportion to the extent of those complications.

Complications:—Nephritis, either acute or chronic, seldom occurs as a direct result.

Pleurisy is a not uncommon complication of rheumatism, and pleuritic pains must be distinguished from those of rheumatic involvement of the articulations of the ribs, or of the muscular structure of the chest walls. Bronchitis and pneumonia may follow rheumatism, but are seldom caused by it.

The heart is affected by this disorder more frequently than any other organ. Hare tabulates 683 cases of acute rheumatism of all ages from St. Bartholomew's Hospital. Of these, 48.78 per cent—nearly one-half—had heart complications. And of 480 cases under thirty years of age, 65 per cent were so complicated, proving that the younger patients are much more liable to heart disease than those

older. The disease attacks the endocardium first, subsequently that portion covering the mitral valves, which are attacked in over 90 per cent of valvular complications. Later the heart muscle is attacked, and the **myocarditis** is soon followed by pericarditis. These are seldom the cause of death during the active period of the rheumatic inflammation. But when the rheumatism abates the heart lesions persist and assume a subacute or chronic form, and for months and perhaps years are the cause of greatly impaired and enfeebled health, and finally the cause of death, or they may incapacitate the patient for any active labor, and result ultimately in other organic or constitutional disease, as dropsy, or Bright's disease, or both, to which the patient succumbs. In children, dropsy and kidney lesions and other organic or nervous disorders may follow rapidly, and terminate in death within a few weeks or months.

Diagnosis:—Abrupt joint inflammation, with its concomitants plainly marked, and fever, is easily distinguishable from other disorders. Arthritis from other causes must be distinguished by the history and often by the persistent fixed location of the inflammation. Septic arthritis, often taken for this disease, follows other acute disorders, especially the exanthemata. Gonorrhœal rheumatism has a previous history of gonorrhœa and has but little elevation of temperature. Osteomyelitis seldom attacks other than the hip joint, and whatever joint is attacked, the bone is involved, rather than the structures of the joint. Monoarticular rheumatism has a previous history of gout and syphilis.

Treatment:—Fever and pain are the primary indications for treatment in acute rheumatic fever. The first remedy is **aconite**; the second is **bryonia**; five drops of specific aconite and ten drops of specific bryonia in four ounces of water should be given in teaspoonful doses every hour for the first three or four days. The specific indications for bryonia are not more strongly marked in any other known disease than in rheumatism. An initial dose of **pilocar-**

pine or two or three full doses of **jaborandi** will determine, not sweating alone, but actual elimination of morbid matter from all the emunctories, and especially from the skin, and will exercise a positive sedative influence upon the temperature. The joint should be wrapped at once in a **hot salt solution**, by saturating soft compresses and covering them with rubber protective, keeping them wet and hot without change. Instead of the solution of sodium chloride, a mild solution of ammonium chloride is used in some cases with better results. Or **libradol** should be applied for six hours if nausea is not induced. This is a medicated dehydrating application, with a base made similarly to other plastic dressings, with lobelia, tobacco and other sedatives. It positively abates the pain quickly and relieves the inflammation. A most serviceable application is antiphlogistine, which has the advantage of producing no untoward effects whatever. It may therefore be applied and retained and kept hot without disturbing the painful joint for twenty-four hours.

Rhus toxicodendron is specific in those cases of this disease, in which the redness and swelling are very great and where the patient is restless and constantly moving.

Macrotys has long been used, and active results are obtained where there is extreme muscular soreness and stiffness of the parts. From twenty to thirty minims in four ounces of water is given in dram doses every two hours.

Belladonna in small doses, given in conjunction with aconite, dispels the extreme local inflammation in the first stage of the disorder, equalizing the circulation. It also supports the heart's action.

Arnica, internally and externally, is an excellent remedy. It is indicated when the joints are sore, with a bruised feeling, very sensitive to the least touch. Ten drops in a four-ounce mixture is given in teaspoonful doses every hour.

The **salicylates** are specific in a general sense, but are accompanied with so many untoward results that they

should be given secondarily to the direct specifics. The **sodium salicylate** is most commonly used, and while superior in many particulars to the potassium salt, it is repugnant to most stomachs and quickly destroys the appetite. The **ammonium salicylate** is less depressant than the others of its class, but its taste is objectionable. The **lithium salicylate** is kindly in its action and exercises a kindly influence upon the kidneys. From one dram to one and one-half drams within each twenty-four hours is the maximum dosage of the salicylates. The **oil of wintergreen**, from which salicylic acid is produced, is recommended for external application and internal use, and good results are claimed for it. Ten minims may be given in a capsule every three hours. The Eclectic fathers thirty years ago recommended **salicin** in this disease and it has proven efficacious and is now advised by regular writers. Fifteen grains may be given every two hours. It acts best when the skin and tongue are moist and the tongue is cleaning and when the temperature is declining, rather than rising. It has no untoward results. This class of remedies, like the directly specific remedies, prevent heart complications. They seem to neutralize the irritating factors within the blood. The **bicarbonate of sodium** is advised in conjunction with the salicylates. We would advise it if there be a broad, thick, pale tongue, coated white, with pale mucous membranes of the mouth, indicating excessive acidity.

Caulophyllum colchicum and **phytolacca** are all of some service in rheumatism, but do not occupy their once exalted position. **Phytolacca** has the special indications of glandular involvement, which must not be overlooked. Sore mouth and sore throat or ulceration of the skin demand this remedy. Lindder advised **colchicum** in those cases where there are tearing, lancinating pains, with nervous worry and irritability.

Xanthoxylum was thought to be a specific by the older members of our school, but it has not grown in popularity. Dr. Morrill has used the following formula recently in sev-

eral cases of acute rheumatism and believes it to be far superior to the salicylate treatment, which he has permanently abandoned for it. He claims that it prevents heart complications; kava kava five drams, macrotys three drams, citrate of potassium four drams, elixir of pepsin to make four ounces. A dram is given every three hours, all necessary precautions being taken against exposure to cold.

CEREBROSPINAL FEVER.

Synonyms:—Epidemic cerebrospinal meningitis; cerebrospinal meningitis; petechial fever; spotted fever.

Definition:—A severe, acute, inflammatory disorder, involving the meninges of the brain and spinal cord; epidemic endemic and sporadic in occurrence; characterized by an abrupt onset, with chill, fever, headache, pain in the spinal column, stiffness and contraction of the muscles of the neck and back, and, in violent cases, early opisthotonos, with impairment of the brain and mental function, mild coma or delirium, dulness of the eyes and irregularly contracting pupils, or pupils irresponsive to light.

Etiology:—The specific cause of the disease in a typical epidemic manifestation is the diplococcus of Weichselbaum, the *meningococcus* or *diplococcus intracellularis meningitidis*. Cases of acute cerebrospinal meningitis occur isolated, and in endemic, or sporadic form, which do not exhibit this specific micrococcus, but are caused either by the streptococcus or staphylococcus pyogenes, and in some cases by the pneumococcus, or by the bacillus of influenza. The disease also results from septicemia and pyemia or from gonorrhœa. It may result from injury, from acute cold, or it may follow as the sequel from infection conveyed from the presence of mastoid disease, or disease in the various sinuses, or from disease of the middle or inter-

nal ear. It is the epidemic form only we are now considering.

The disease is most common among children and those of early youth, but it attacks adults up to perhaps twenty years of age quite commonly. No age, however, is free from liability to attacks during an epidemic. The disease prevails more commonly in the colder portions of the temperate zone, and during the winter and early spring months. It is unknown in tropical climates. It occurs among those living with unhealthy surroundings and with poor hygienic conditions, as well as among those who are well situated. Under some circumstances it has been known to attack those of the better environment first.

Symptomatology:—This disease has a variety of manifestations, with a few typical symptoms. In the epidemic form, as a rule, there are no prodromes, the patient being suddenly stricken down, from previous good health. Usually there is a chill, which is almost immediately accompanied with headache and dizziness, with an abrupt development of fever. The temperature usually is not high, but severe cases will reach 104° F. and hold that point steadily, with but slight variations for from twenty-four to thirty-six hours. A temperature of 102.5° F. is more common, and is usual with the milder cases, or with those of slow development. In many cases there is no marked variation in the temperature, often there is no change for a long period, but a reduction or increase of one degree perhaps within twelve or eighteen hours is not uncommon. There are no intermissions and but slight remissions, with no regularity in their appearance.

The headache, which is one of the first symptoms, rapidly increases until it becomes almost unbearable. This is accompanied with severe pain in the spinal cord, involving the muscles of the back. These muscles soon become rigid and the tenseness involves the muscles also of the thighs, arms and neck. Brain symptoms appear quickly, and consciousness is soon lost, the patient becoming dull and stupid

and developing a mild delirium. In other cases the patient lies with the eyes open, but takes no notice of things around him and is soon found to be partially unconscious. In other cases there is great restlessness, with a high degree of nervous excitability.

A profound convulsion may occur early, usually in the form of opisthotonos, although this is rare. Commonly the stiffness occurs in the muscles of the back of the neck, the head is drawn backward and forced into the pillow, the head can be moved from side to side, but flexion and extension will result in excruciating pain, the posterior cervical muscles are hard and in a state of tonic contraction from irritation of the anterior roots of the cervical nerves. In infants the constant movement of the head from side to side, with the crowding of the occiput into the pillow, is almost a classic symptom. The author has also observed that infants and young children will close the thumb across the palm of the hand, with the fingers closed over it, in the developing stage of this disease. This may be a positive diagnostic symptom before other characteristic evidences have appeared.

The pulse should be carefully studied in this disease. At first it is of good volume, with no increased tension and from 120 to 130 beats per minute. Later it increases in rapidity, but becomes soft and easily compressible. With nervous irritation it becomes rapid, small, hard and wiry, and in the fatal cases it is small, feeble, very rapid and usually thread-like. The respiration is apt to be irregular if there be any degree of nervous irritation or convulsions. If there is stupor, it will be regular, slow, and in severe cases stertorous. In advanced cases sighing respiration with Cheyne-Stokes breathing is common.

Hyperesthesia develops very soon after the appearance of muscular rigidity. The skin and muscles become very tender and sensitive, so that slight pressure produces pain, and, as in strychnin poisoning, may produce convulsions. Voluntary movement of any of the muscles causes more or

less severe pain. In contradistinction to this condition is anesthesia, which occurs in a few cases, over circumscribed areas.

The **eruption** of meningitis occurs in perhaps one-half of the sporadic or endemic cases. In epidemics it is present in the larger number of cases. It may occur in the form of herpes, first on the lips, as in malaria—**herpes-labialis**, and subsequently upon the face—**herpes-facialis**—an eruption which is peculiarly characteristic of this disease. Herpes may appear also upon the trunk, upon the thighs or around the genital organs.

In other cases, and by far the most common, is the petechial eruption, from which the disease has the name of spotted fever. This occurs in the form of irregular purpuric spots, which may be diffused or limited to a small area. At first the eruption is quite red, later it occasionally becomes dark and appears as ecchymoses. Other forms of eruption are present in individual cases, and bed sores with circumscribed gangrene should be anticipated.

To those who are experienced, the appearance of the eye assists greatly in diagnosis. Most commonly the eye is dull, with a dilated pupil. The eye may be very bright, with contracted pupil, or the pupils may be unequal in size, and in all cases not readily responsive to light. The conjunctivæ usually assumes an injected or chemosed appearance, and photophobia is common. Strabismus is frequent, but may appear and disappear, to recur at a later interval, sometimes recurring several times during the course of the disease. Ptosis is usually present and keratitis may occur. In some cases the patient has become permanently blind.

In the isolated cases, dulness of the mind, with somnolence, or stupor may occur early. In fatal cases this increases to coma, with no recurrence of consciousness. With the dulness there may be mild delirium, or nocturnal delirium only may occur, independent of any tendency to stupor. Active delirium with violent manifestations is not uncommon in the early stage. This may be accompanied

with hallucinations, and in the female with hysterical manifestations.

Vomiting is not an uncommon symptom. It is often of cerebral origin, but may be induced by faults of the stomach. The tongue is usually thick and pale, but slightly coated, and the appetite is early lost, but later the tongue becomes dark and dry, the secretions are all suppressed and sides appears. Constipation is apt to be present, with tympanitic distention of the bowels.

At first the patient passes a large quantity of pale urine of low specific gravity. Later it is reduced in quantity, until but little is passed, which has a high specific gravity. Retention, suppression and incontinence are not uncommon during the later stages of the disease, and albumen and sugar are found in rare isolated cases.

A septic arthritis is apt to occur with this disease, which may induce serious changes in the joints, or deformity.

In 1884 Kernig showed that where the membranes of the cord were inflamed, if the thigh was placed at right angles with the plane of the body, it was impossible to then extend the leg upon the thigh. This results from irritation of the meninges of the cord, and of the nerve roots in the cauda equina. This is known as Kernig's sign.

Diagnosis:—The abrupt occurrence, with the conspicuous cerebral symptoms, the head usually being intensely hot, will suggest the seat of the disease. The author has observed the inturned thumbs in small children before any other manifestation appeared. Retraction of the head and rigidity of the limbs are suggestive, but not positively diagnostic. The hyperesthesia, extreme pain in the head, rapid prostration, tonic or clonic convulsions and tonic contractions of the muscles of the neck and the purpura are usually sufficient. The presence of the diplococcus of Weichselbaum in the cerebrospinal fluid will confirm the diagnosis.

Prognosis:—The prognosis must always be guarded, as in severe epidemics from fifty to seventy-five per cent of the cases will die. In mild epidemics from twenty to thirty per

cent are fatal. In sporadic cases the mortality is very high, especially in young children.

In mild forms the case will run from four to seven days. In severe forms it is apt to terminate before the fourth day. Isolated cases may develop slowly and vary greatly in the length of the course, running from two to six weeks.

Treatment:—The care of the patient is of great importance. Medical treatment has been unsatisfactory. We have much to learn in the adaptation of drugs in the cure of this disease. The patient must be confined in an isolated room, away from confusion and noise of every kind, with a most careful and conscientious nurse, and the room should be darkened. In the pronounced cases good results have been obtained by placing the patient in a medium hot bath which contains mustard sufficient to produce a marked redness of the skin, within from fifteen to twenty minutes. This may be repeated on the second and sometimes on the third day to good advantage. Other patients have been benefited by applying a warm, sharp **mustard poultice** the entire length of the spine and over the spinal ganglia and repeating this poultice as often as the skin will permit. Profound derivation has produced good results in a number of cases.

The author prefers the persistent and uninterrupted use of heat to the entire length of the spine and at the base of the brain, using cool or cold applications on the forehead or top of the head. It is good treatment to first apply **libradol** the entire length of the spinal column till mild nausea is induced. This may then be replaced with any other plastic dressing, and **dry heat** should be applied by means of hot-water bags outside of the dressing and retained for a period of twenty-four hours. The bowels should be unloaded with an active **saline cathartic**, but this should not be too often repeated.

Where there was profound nervous irritation, with great excitability and restlessness, with opisthotonos within two hours after the onset of the disease, in one case, in the first

year of my practice, following the instructions of the patient at the onset, who was an old, experienced Eclectic physician, I administered extreme full doses of **gelsemium** with a hot infusion of **capsicum** and **ginger**, applied a strong mustard poultice to the entire back and persisted in this treatment for eighteen hours, with most satisfactory results. Where there is dulness, with cool skin, the patient sleeping with the eyes partly opened and the pupils dilated, **belladonna** is of much service. If with these symptoms there is restlessness and irritability, the head being very hot, **ergot** should be given in full doses for the first forty-eight hours. In strictly sthenic cases, with great excitability, the pulse being very strong, the patient restless and uneasy, with deficient excretion, a single full dose of **pilocarpine** hypodermically will do much to abort the disease. **Jaborandi** in two or three drop doses may be continued through the progress of sthenic fever. In very small children, **aconite** and **ergot**, in combination, in minute doses frequently repeated during the first stage of the disease will often produce very satisfactory results. **Aconite** is of great service if persisted in in those cases that are prolonged. Where there is much soreness over the spine it should be given in larger doses four or five times a day only. The author has much confidence in the persistent use of small doses of **bryonia** to overcome the inflammatory reaction and to control the temperature. It may be necessary to give it in conjunction with **gelsemium** or **passiflora** for the spasms.

There is no doubt that **calabar bean** is an important remedy in the treatment of this disease. If the author was to designate specific indications he would select those cases where the skin is cool, but where the pupils are contracted, the pulse small and feeble, but Dr. Edson of Indiana has used it indiscriminately with excellent results, expecting, however, better results where there is feebleness with weak pulse. The dose is from one-fourth of a drop to a drop, for a child, every thirty minutes; to an adult two drops may be given every fifteen minutes. The doctor expects

good results within a few hours, but has known cases where the remedy was necessarily continued for two weeks or more.

Dr. Webster is enthusiastic concerning **echinacea** in meningitis, and we believe that it will yet prove a most valuable addition to our best known methods. It may be given in full doses from the first and continued through the entire course of the disease, without regard to the indications for other remedies. It antagonizes sepsis, restrains undue temperature, preserves the functional action of the various organs and encourages nutrition.

The bromides or **hydrobromic acid** will be found of much service in this disease at times, the latter indicated when a sedative is needed with the presence of the usual indication for an acid remedy. Given in conjunction with ergot, it will sometimes control delirium when all other measures have failed. **Chloral hydrate** given in doses of from fifteen to thirty grains, in solution, in the rectum will often prove satisfactory in controlling or preventing convulsions. **Veratrum** may be given for convulsions during high temperature with rapid pulse. A few large doses of perhaps five minims may be given until slight nausea is induced, or until the pulse is slowed to normal. The use of **opium** has been advised in this disorder, but we would proscribe it except in cases of excruciating pain, otherwise uncontrollable. **Apocynum** is of service from the very first, in preventing the development of effusions and later in removing effusions and sustaining the action of the heart.

It must be borne in mind that no two cases can be treated alike. Each case will present its characteristic indications, and indications will be found present often, for a remedy which is not usually considered as essential in the treatment of this disease. The indications must be carefully studied, and closely followed with the administration of the exact remedy.

The patient should receive a concentrated and highly nutritious diet, and the digestion and appropriation of all

food should be assisted by the administration of artificial digestives. The disease is rapidly exhausting in its character and all measures must be adopted that will sustain the strength. **Milk, eggs, beef juice, rice, and fruit juices** must be given freely.

When the active symptoms have abated, the physician should in no wise relax his assiduous attention, as the period of convalescence is apt to be long and recovery very slow. If the spine remains tender, dry cups, the persistent use of plastic dressing, perfect rest and the use of carefully selected tonics are of much importance. **Iron, phosphorus, small doses of quinin, hyoscyamus and calabar bean** will be among the indicated remedies.

YELLOW FEVER.

Synonyms:—Yellow jack; black vomit; *febris flava*.

Definition:—An acute highly infectious, epidemic and endemic disease, characterized by an abrupt period of invasion, followed by a remission and that by a relapse. Also by a high fever accompanied by a yellowish discoloration of the skin (often mottled), frequently by oozing hemorrhages from mucous surfaces, and by a black vomit. It is indigenous to America and is common in the sub-tropics and tropics of this country. It has a most interesting history.

Etiology:—This disease prevails during the middle and late summer months and is abruptly terminated by frost. Whites are more readily affected than blacks, and children and males, than females. A specific organism called the bacillus icteroides is found present in this disorder, which is readily conveyed by the mosquito, although this is probably only one means of infection. The mosquito must bite a sick person and thus become infected. A bite from the mosquito after twelve days will convey the disease to an

individual not rendered immune by a previous attack. The disease is not conveyed by fomites, consequently disinfection is not essential. Cleanliness, however, and good hygienic surroundings are all important.

Symptomatology:—There are usually three distinct stages to this disease. For a few hours only before the abrupt onset of the disease, are there any prodromata. These are **malaise**, some **lassitude**, **vertigo** and **headache**. The **rigor** is sudden and unannounced, and with it there is **pallor**, severe **muscular pains**, especially in the back, and with the headache, which is usually very severe, there is pain in the eyes, and much **distress** in the **stomach**. There is a rapid **rise** in the **temperature** to 104.5° or even 106° F. within twenty-four hours. This usually persists for two or three days, although in the mild cases there will be a **fall** of the **temperature** within a few hours. When the fever persists there are slight morning and evening remissions until the end of the third day, when the **remission** in the fever is marked and all the phenomena abate, the pulse remaining abnormally slow. There are, however, marked evidences of serious impairment of health, and at this time the characteristic **jaundice**—the yellow or bronzed condition of the skin and conjunctivæ—appears, which is pathognomonic of this disease. If all conditions are favorable and if the previous course of the disease has not been too severe, the patient may recover from this point.

After one day perhaps, or a little less or more, there is a recurrence of all the symptoms in greatly aggravated form. **Exhaustion** occurs with signs of collapse, the temperature may rise even beyond its previously highest point (**secondary fever**), or it may fall below normal and the skin become positively cold (the **algid form**), with a rapid and compressible pulse, increased gastric distress, and the **vomiting** of, at first, a clear liquid in which float reddish or brown flakes which increase in quantity and color until it assumes the character of well known black vomit.

Hemorrhage may occur from the stomach and unchanged

blood may appear in the vomit. Or passive hemorrhages may be general from all mucous surfaces or even from the skin. With these serious symptoms an abatement and a change for the better may occur, but this is rare. There is usually a **suppression** of urine more or less complete, with **serious depression** rapidly approaching collapse, hiccough, the so-called "Hippocratic" facial expression, subsultus tendinum, coma and convulsions, which may be of uremic origin, and death. The urine of yellow fever is often **albuminous** from the first, and this is considered a positive evidence in the diagnosis. The quantity is lessened at the onset and often decreases to final complete anuria.

There is a wide variation of symptoms in this disease. The course above outlined is most common, the three stages being distinct. But the course may be different in individual cases in a given epidemic. Or an entire epidemic may assume peculiarities of manifestation. The algid form may predominate, in which there is sub-normal temperature and no secondary fever, or there may be a type designated as apoplectic, in which extravasations within the tissues of the brain occur early, with dulness increasing to coma and paralysis or convulsions. In still another form the symptoms of cholera are so marked as to render a correct diagnosis extremely difficult.

Diagnosis:—When there is as yet no prevailing epidemic of this disease, an exact diagnosis may be extremely difficult. When an epidemic is declared the sudden onset, the intense backache, the pain in the eyes, and after perhaps forty-eight hours the marked slowing of the pulse while the temperature is yet very high, are characteristic. In the period of remission the jaundice will determine the diagnosis, and later the black vomit, with increased jaundice and suppressed urine, are unmistakable evidences.

The facial expression is of great assistance in diagnosis, to those familiar with the disease. The extreme flushing of the face and the intensely injected and jaundiced eyes, are characteristic.

The early development of albuminuria will be of assistance. Remittent fever is milder, has regular daily remissions and no black vomit. The disease in isolated cases is mistaken for dengue especially; also for relapsing fever, and for pernicious malarial fever.

The latter has protracted chill, early remission, no albumin, no vomit. Relapsing fever has the spirillum of Obermeier in the blood, enlarged spleen, but little jaundice, no vomit, and no initial albuminuria. Dengue is characterized by the extreme bone pains, the marked remission and the eruption.

Prognosis:—The mortality varies in different epidemics; some are light, some virulent. In severe cases with no improvement in the second stage, the prognosis is bad, as from thirty to forty per cent die. In virulent epidemics the mortality has been as high as eighty-five per cent. A larger number of men are attacked, and less blacks than whites.

Treatment:—Specific measures in the treatment of this disease have not been determined. If the various indications are met, they must be positively met, with full dosage of the remedies. Sternberg advised the **bicarbonate of soda** in large, full and persistent quantities in all cases during the course of the disease. The method has not been sustained, although its benefits are not questioned. The facial symptoms suggest **gelsemium** in full and persistent doses. **Iris**, **chionanthus** or **chelidonium** should be given early to retain and sustain the normal action of the liver. The organ should not be overstimulated. The bowels should be moved early with laxatives that in no way irritate the stomach. At the onset, hot **mustard baths**, persistent foot-baths and counter irritation over the spinal cord will be found of benefit. When albuminuria appears, **dry cups** should be applied over the kidneys, and subsequently **persistent heat**, especially when the pulse begins to run slow. On the first and second day of high fever cool sponging may be resorted to. Much benefit will be derived after the second day from mild iced infusion of **capsicum**, which should be continued

to nearly the end of the first stage of the disease. The infusion should then be given hot through the second stage. This will relieve hiccough should it appear. If a drop or two of **carbolic acid** or **creosote** be dropped into and dissolved in this and taken three or four times daily it will soothe the irritation of the stomach and in part control the vomiting.

In the remission, **gelsemium** and **quinin** together will be found of much service in full, large doses. Heat to the kidneys must not be neglected. The urine should be examined daily and uremia anticipated and combated. Early exhaustion and heart failure will be met promptly with **cactus**, **avena sativa** in the hot capsicum infusion, and **strychnin arsenate**. At any time when sudden exhaustion threatens, especially during the third stage, the physiological **salt solution** should be introduced into the colon, hot. If the exhaustion be extreme, hypodermoclysis should be resorted to.

The **feeding** of these patients must be most carefully conducted. Milk to which is added a little lime water or soda, or milk predigested, will be sufficient for the first two days. It may be given iced or ice cream will be acceptable in some cases when the temperature is high. The white of an egg thoroughly beaten and dissolved in water and seasoned with cinnamon is acceptable. Fruit juices or dissolved jellies to which a little infusion of capsicum is added will sustain the strength of the patient. Rectal enemata of stronger diet may be resorted to at times. During convalescence the diet may be increased by eggnog, and later by very soft boiled eggs, beef tea from beef extract, hot broths, and toast.

The patient must lie quiet in bed in a properly ventilated room, and annoyance of every kind avoided. The bed pan must be used throughout the disease and through early convalescence, and the discharges must be disinfected. The patient must not arise from the bed until much strength has been regained, and especially until the weakened heart muscles have been restored. During this latter period **phos-**

phorus, nux vomica, strychnin, hydrastis and **iron** may be given with satisfaction.

During the course of the disease, indications for **echinacea, polymnia uvedalia, iris** or **lycopus** may occur, as well as for **baptisia** and **dioscorea**. **Echinacea** may be given from the first with **gelsemium, aconite** or **bryonia**. If it be continued in from ten to fifteen drop doses throughout the entire course of the disease, there is no doubt that favorable results will obtain, especially if blood infection, uremia, and nervous phenomena therefrom are apparent. **Belladonna** or frequently repeated small doses of **atropin** will be indicated in some cases at the end of the first stage, and if given in sufficient dosage will sustain an equalized circulation and will tend to prevent cerebral congestion and congestion of the glandular organs.

DENGUE.

Synonyms:—Break bone fever; dandy fever; bouquet fever; three day fever.

Definition:—An acute, infectious, epidemic disorder, characterized by a double febrile paroxysm accompanied with severe aching pains in the joints and muscles, and in perhaps one-half of the cases with a cutaneous rash.

Etiology:—The specific cause of this disease has not been discovered. More recent experiments have been made to determine that it is conveyed by mosquitos, but, while evidences are strongly in favor of that theory, nothing conclusive has been arrived at. The disease occurs in hot weather and more frequently in low altitudes, and conversely is abruptly terminated by the occurrence of cold or frost and by taking the patient to a high altitude. The disease spreads in a locality with incredible rapidity, and sometimes attacks almost the entire community without regard to race,

sex or social condition. The disease seldom occurs except in tropical or sub-tropical climates.

Symptomatology:—The period of incubation is short, not more than four days, and there are almost no premonitory symptoms. The attack occurs abruptly; the suddenness of the onset is characteristic. There is a **chill**, not necessarily severe, followed at once by **fever**, which may reach 106° at the end of the first day. The **pain** in the limbs described as **bone breaking**, accompanies the fever, and the **headache** is most excruciating. The pain is increased by any movement of the patient, and the joints become swollen, red and excruciatingly tender, resembling acute rheumatism. The patient's sufferings are indescribable. The **tongue** is heavily **coated**, there is **loss of appetite**, and often, though not always, severe **nausea** and vomiting. There is rapidly increasing **prostration**, with rapid respiration and pulse. The **rash**, which occurs in perhaps one-half of the cases, is an **erythematous eruption** resembling somewhat that of scarlet fever, or it may be roseolar and papular.

After two or three days of fever, there is a **crisis**, the temperature drops, there is **profuse sweating** with diuresis, **diarrhea** and perhaps **dangerous epistaxis**. The active symptoms abate or disappear temporarily and the rash fades. In a few cases, at about the end of the second day, while the temperature is at its highest point, the pulse begins to fall, and continues to fall until it is as low in some cases as 45 beats per minute. It falls to at least 70 beats before there is any apparent decline in the temperature.

While the patient is improved and is able to be up, he is not well, and after from two to four days a **second attack** occurs similar to the first, but seldom as severe. This may last but a few hours and not above two days. With this the rash develops again and may last for some days, disappearing finally with a mild desquamation which may be weeks in disappearing.

The complete recovery of the patient is very slow. There is **soreness** and **pain** in the **muscles** and joints for a long

time, and in the soles of the feet. The prostration, which is not as great as that of some other infectious fevers, is not readily recovered from. The patient is **restless** and **sleepless**, and **boils** may develop.

Differential Diagnosis:—In many points Dengue resembles influenza or la grippe and may be mistaken for it. The absence of an eruption and the presence of the characteristic germ of influenza will decide the diagnosis and the entire absence of an eruption in acute rheumatism will distinguish it from that disease.

Scarlet fever differs in the character of the onset, the eruption, in the course, and in the absence of a relapse and of any rheumatic symptoms. It is most difficult to distinguish in hot climates at times, between this disease and yellow fever. The rapid, steady rise and sudden termination of the fever in the latter disease, with jaundice, black vomit and a hemorrhagic tendency, and no second attack will assure a diagnosis.

Prognosis:—The prognosis is good, as persons in middle life, previously healthy, seldom die of it. In the aged and in infants it predisposes to complications, notably those of the lungs or bronchi or of the nervous system, to which the patient may succumb.

Treatment:—In this disease we have many distinct indications for specific remedies. The bright, flushed face, bright eyes and restlessness, will be specifically met by **gelsemium**, and no remedy has accomplished more than this. Conjointly with **macrotys** and alternated with **bryonia**, almost the entire group of symptoms is met and successfully combated. Gelsemium must be given in full doses at the onset of the attack. Five drops of the specific medicine every hour for a few doses, then in a lessened dose or after a prolonged interval, will secure results. Another directly indicated remedy is the **sodium salicylate**. Three doses of fifteen grains each, given two hours apart, should abate the headache and bone pains most satisfactorily. These doses may be given alternately with full doses of

gelsemium. A single dose of eight grains of acetanilid, or of phenacetin, may be given at the onset with good results, but the specifics will be very satisfactory in their action. **Bryonia** should be begun early and continued in frequent small doses through all stages of the disease, as long as the cutting pains in the joints and other of its indications are present. During convalescence the **strychnin arsenate**, $\frac{1}{62}$ of a grain every two or three hours, will be of much service. Other tonics should be directed to the stomach and to food appropriation. Auxiliary measures, such as a **hot bath** at the time of the chill, subsequent cool sponging, cold to the head, a hot foot-bath will suggest themselves as their indications appear.

Exanthematous Diseases.

VARIOLA.

Synonym:—Smallpox.

Definition:—An acute infectious disease, the chief characteristic of which is an eruption which passes successively through the various stages of macule, papule, vesicle and pustule, ultimately becoming umbilicated. There is an active febrile movement, severe pain in the back, and vomiting.

Etiology:—Much difficulty has been experienced in determining the exact cause of smallpox. More recent observations have confirmed the opinion that it is due to a parasitic microorganism, the *cytorrhycles vacciniæ*.

The contagion is spread by direct contact with the body or clothing of the patient, or by anything that he may have come in contact with. It may be readily carried by an individual, from one patient to another, and has been conveyed by letters sent by the patient or from the sick room to friends at a distance. It is also conveyed by insects and vermin. Much effort has been made to determine to what degree the infection is carried directly through the air, with no intervening medium. It is believed that it may be so conveyed for nearly half a mile. The vitality of the virus remains for a long time after the death of the patient, and the bedding and furniture of a room will convey the disease for many days, unless thoroughly disinfected. The disease is peculiar to no age, race, climate or sex. Infants and young children are more readily attacked and are more seriously affected. Adults from twenty

to thirty-five years of age furnish the larger per cent of the cases, probably because at that age they are in a position to more readily become infected, or to carry the infection. The negro race is particularly susceptible, and with them the disease is very fatal.

It prevails more extensively in the winter months, declining in the spring and as the summer approaches. It prevails in tenement neighborhoods and in the crowded regions of large cities. The severity of the attack in an individual patient does not depend so much upon the virulence of the infection, as upon the susceptibility of the individual. A typical case, however mild, may convey the disease in all the virulence of a confluent, or hemorrhagic form, to a susceptible individual.

Symptomatology:—From six to twelve days after exposure to the infection the first symptoms appear. The premonitory symptoms are a most severe **backache**, general **malaise** extreme **muscular soreness** and an excruciating **headache**, usually frontal. Almost simultaneously with the occurrence of these symptoms is a severe **rigor** and the rapid development of a **high temperature**. The pulse becomes decidedly rapid, the respirations are increased and the patient has all the evidences of severe illness.

During the past five years our country has been subjected to a visitation of the disease in an exceedingly mild form, so mild that its real character has been seriously questioned by many observers, it having been frequently diagnosed and treated as a severe case of chicken pox. The infection from these cases did not convey the typically severe form of the disease in any instance.

Other symptoms are **nausea**, **vomiting**, **loss of appetite** and usually obstinate **constipation**, although in a few cases an intractable **diarrhea** has appeared. The pulse at the onset is rapid, but it is usually full and strong until the eruption appears. The **temperature** at the onset may reach 105° F. within the first twenty-four hours, and perhaps 106° F. at the end of forty-eight hours. This high tem-

perature is maintained with but little variation, until the **eruption** appears. At this point there is a rapid reduction of the temperature to perhaps 99° F. or perhaps 99.5° F., where it will remain until the pustular stage of the eruption occurs, when it will rise abruptly from 102.5° F. to 104° F. This is called the **secondary fever**. It has regular morning remissions, and if the disease progresses favorably will ultimately end by lysis on the twelfth or fourteenth day. In some cases this secondary fever may be so mild as to be overlooked.

This disease is properly classified by the character of the eruption, into three distinct forms, the commonest of which, the discrete form, presents the symptoms which we have just given. The other forms are the confluent form, and the hemorrhagic form, known as black smallpox, or malignant smallpox.

In the **discrete form** of the disease, the eruption appears about the third day, in the form of coarse red spots, usually upon the forehead first, and at the edge of the scalp, and on the wrists. The macular appearance of the eruption soon develops into a distinct papule, somewhat elevated and hard upon pressure, and conveying to the finger an indurated feeling, as if a single small shot was just beneath the skin. After perhaps twenty-four hours a tiny vesicle appears at the seat of the induration, which increases in size to the fifth day, when it is about the sixth or the fourth of an inch in diameter and contains a peculiar lactescent fluid. The vesicle does not collapse upon the escape of the fluid, and is surrounded by a distinct, narrow, bright red areola. The center of the vesicle becomes depressed, and by the sixth day it assumes the characteristic umbilicated form. The fluid may become cloudy or purulent until, by the seventh or eighth day, it is distinctly pustular. The pus dries upon the surface of the eruption and forms a distinct scab, which is supposed to contain the characteristic infection of the disease.

There is a characteristic odor from the pustule of small-

pox which to those who are familiar with it, becomes diagnostic.

In the **confluent form** of this disease the symptoms at the onset are apt to be more severe and the eruption appears earlier, the papules are much more abundant, the bases approximate each other more immediately, and by the time the pustule has developed, the entire surface of the skin is covered with a suppurating eruption. So severe an involvement of the entire surface of the body produces most serious impressions. The nervous system becomes involved, the lymphatics are swollen with the inflamed condition of the skin, and symptoms of general pyemia, with extreme typhoid phenomena, will develop.

In the form known as **black smallpox** a change takes place in the character of the blood. Its coagulability is impaired and hemorrhages take place into the skin, the mucous membrane and the viscera. In the more benign form, hemorrhage occurs into the pustule only, especially in those of the lower extremities. In the more dangerous form, the hemorrhages occur from the eruption, and from various points on the mucous surface, and into the various organs of the body. When a distinct hemorrhagic diathesis develops, the blood becomes diffused beneath the skin also, and there are extensive ecchymoses. These may appear before the characteristic eruption shows itself; nose bleed, bleeding from the gums, bleeding from beneath the conjunctiva, from the palate or tongue, is common, as well as bloody vomit, bloody stools and hematuria. These cases are nearly all fatal.

A rash appears in some cases of smallpox, which may be general over the entire surface of the body, and mislead the physician in his diagnosis. In some cases it closely resembles the initial rash of scarlet fever, in others it is similar to that of measles. As these rashes disappear quickly on the development of the smallpox eruption they should not deceive the physician, if he is a close observer.

VARIOLOID:—When smallpox develops after success-

ful vaccination, every phase of the disease is greatly modified, the disease presents itself in a mild form, with symptoms characteristic of the modified disease. It is not necessary to describe the symptoms of varioloid separately, as it would be simply a presentation of all the phenomena in a milder type. It may be well to state that a diffused eruption is more apt to occur in varioloid than in variola. This simple or modified form of the disease is more apt to occur in patients who have not been vaccinated for many years, or in patients who possess a natural immunity to the disease. It should be borne in mind, however, that the infection from varioloid is not necessarily modified, but that the severe type of smallpox may be as readily contracted from this as from the primary severe disease.

Complications:—Considering the severity of smallpox, it is a matter of surprise that so few complications occur. Perhaps the commonest is septic arthritis; bed sores appear in protracted cases, erysipelas is not uncommon, inflammation of the lymphatic glands, with abscess, appears as a natural result of pus infection, and inflammation of the post nasal membrane, mastoid abscess, pharyngitis, laryngitis and bronchitis may appear, although they are not common sequelæ.

A pregnant woman attacked with smallpox may abort early or she may pass through all of the stages of the disease with no abortion induced. The child may be born with all the manifestations of the disease, or it may be found to be immune to the disease, without presenting the usual evidences, or the disease may develop shortly after birth.

Diagnosis:—It is only in the early stages of this disease that the diagnosis presents any difficulties. The presence of an epidemic, and the fact that the patient has been exposed, will suggest the possibility of the occurrence of this disease. The sudden onset, with severe illness from the first, the extreme backache and headache are characteristic. The absence of any soreness of the throat will exclude the probability of scarlet fever or diphtheria, as will also the ab-

sence of the peculiar abrupt vomiting, which is present at the onset of scarlet fever. There is but little danger of confusing the eruption of smallpox with any other eruption, except perhaps that of chicken pox and impetigo contagiosa. In chicken pox the constitutional symptoms are very mild, and in impetigo the development of the disease begins with the appearance of single blebs or blisters which have none of the peculiarities of the developing smallpox pustule

Prognosis:—In varioloid the prognosis is always favorable. In the confluent and hemorrhagic types, the prognosis must be guarded as the mortality is very high. If large ecchymoses develop or severe hemorrhages occur, death is almost certain. In young men and in negroes the mortality is greater. The cases which have been previously vaccinated at whatever period of life are greatly modified. The occurrence of complications will increase the death rate.

The mortality from smallpox in unvaccinated cases is about twenty per cent. In vaccinated cases, where the disease occurs, which is rare, the mortality is from three to eight per cent.

Treatment:—The first and essential course to adopt with all patients, when known to have been exposed, or when the disease is anticipated, and it is not known that the patient has been exposed, is to have the patient immediately **vaccinated**, as this invariably modifies the course of the disease, if it does not prevent it. The patient must be **isolated**. This can not be successfully done except in a well equipped smallpox hospital, although in localities where the disease is not generally prevalent a small detached house can be secured and temporarily equipped to accommodate one or more patients. Good ventilation is important in the sick room, with the very best of nursing. Everything should be removed from the room, except the essential furniture, the patient should be allowed to drink **water** freely, and iced milk or **buttermilk**, with **lemonade** or **fruit jellies** dissolved in water, may be ad-

ministered *ad libitum*. The administration of alcoholic beverages in regular small doses, is essential during the period of the remission of the fever, and at any time when there seems to be a failure of the vital forces. During the period of active fever a special sedative should be selected with reference to the most conspicuous fever indications, and to this remedy **belladonna** in reasonable doses should be added, and continued usually during the entire period of eruption.

We have no more important remedy in smallpox than **echinacea**. It should be given from the first and persisted in till the end of convalescence. It antagonizes all the essential processes of the disease and exercises no influence that could be at any time detrimental or that would not work harmoniously with any other indicated remedy. It has been applied externally also with the very best of results. Its influence as an internal and external antiseptic is all important. It stimulates the capillary circulation, promotes free elimination, antagonizes septic development of whatever character, inhibits to a marked degree the formation of pus, prevents gangrene and stimulates the skin in such a manner that the eruption is very mild, and in some cases the pustule heals with but little if any pock.

Combined with this to excellent advantage is **berberis**; it should be given in small doses, perhaps five minims with fifteen minims of **echinacea** every two hours. **Phytolacca decandra** and **baptisia** are both excellent remedies, antagonizing sepsis and promoting normal glandular activity.

It is advisable often to stimulate the kidneys to a slight degree, which may be done with small doses of the acetate or the citrate of **potassium**.

Rhus tox is a valuable remedy in the eruptive stage, especially if the skin is very red, with burning and itching. It modifies the cutaneous inflammation and favorably influences the progress of the disorder. Some cases present the specific tongue and mouth symptoms of this remedy conspicuously, and in these it should not be omitted. Ten

drops in four ounces of water should be given in teaspoonful doses, every hour, for a short time.

Sarracenia purpurea has been advised by a number of writers as a remedy that will meet many of the indications of smallpox satisfactorily. It should be persisted in from the onset.

Black cohosh is spoken highly of as meeting many of the indications. It is indicated by the extreme muscular and bone pains, and persistent aching in the muscles. Scudder lays great stress upon the action of this remedy.

A remedy which is important in antagonizing the septic processes is the **calcium sulphide**; it should be given in doses of from the one-twentieth to the one-twelfth of a grain, in the latter stages of the disease.

All of these agents antagonize to a greater or less degree certain elements of the profound **toxemia** which occurs in this disease as its most conspicuous factor, due largely to the complete shutting off of exudation through the skin. It is difficult to procure sufficient elimination. The kidneys must not be over stimulated, and experience has proven that cathartics are worse than useless; these facts render efficient action of the above named remedies the more important.

For external application **echinacea** is of the highest importance, as has been stated. It may be used twice or three times daily with which to sponge the surface. A ten per cent solution is about the proper strength in mild cases. Where **ecchymosis** or **gangrene** are threatened it should be occasionally applied in full strength, over small areas, although there can be no objection to so applying it to the entire body.

The author has applied a stiff ointment made by combining equal parts by weight of the **subnitrate of bismuth** and **lanolin** to which a little **boric acid** is added, to a characteristic vaccination **pustule**, with the result that the inflammation was not great and the scar was almost completely obliterated. He has thought from this, that if this oint-

ment was applied over the **eruption** on the face and neck freely, and covered with a mask, it might modify the pock marks somewhat, and it would undoubtedly ameliorate the violence of the inflammation of the skin, especially if **echinacea** had been previously applied.

Hare suggests the use of **carron oil**, which is composed of a mixture of equal parts of **linseed oil** and **lime water**, to the skin to relieve the itching and burning.

As auxiliary treatment, if the pain be severe, a solution should be made of one grain of **morphin**, a dram and a half of **sodium bromid**, and ten minims of **specific hyoscyamus** in two ounces of water or simple syrup. This should be given in dram doses every half hour or hour, for severe pain, general distress, violent **muscular aching**, great **restlessness** or **sleeplessness**, until the patient is relieved. It will usually not be found necessary to administer more than three doses until relief is obtained, after which an occasional dose only should be administered as needed.

When **hemorrhages** occur **gallic acid** should be given in full doses of ten grains every two hours for a time. **Thuja** is also of much service at this time, exercising a double influence in antagonizing sepsis also. As a restorative, **iron** is important, either in the form of the tincture of the **chlorid**, the precipitated carbonate or the citrate.

While these suggestions cover the prominent indications, no two cases will exhibit the same characteristics, and the true specific medicationist will find other conspicuous indications arising, which, from his knowledge of the action of his remedies, will point strongly to a specific agent, which should be administered unhesitatingly if the indications so demand, without reference to whether the agent has or has not been advised in the treatment of the disease.

VACCINIA AND VACCINATION.

Synonym:—Cowpox.

Definition:—Vaccinia is a mild eruptive disease occurring originally in heifers and cows and characterized by an eruption upon the teats and udders. It is induced in mankind by inoculation with the serum from a cow pock, for the purpose of producing the immunity from smallpox which the bovine disease confers. This inoculation is called **vaccination**.

Direct inoculation from a smallpox pustule has been practiced in China for centuries, and was introduced into England and quite extensively adopted for many years prior to the discovery of the immunizing power of the vaccinia vesicle which was discovered by Jenner in 1778 and announced to the world in 1798.

Vaccination is now made obligatory by nearly all the civil governments of the world. The results of the method, in almost annihilating smallpox as an epidemic disease, have proven that successful vaccination and revaccination will confer complete immunity against variola. A feeble opposition is still made against its practice by those who do not take a comprehensive view of the field. They enforce their argument by the fact that an occasional case is infected from careless methods or from the use of impure virus.

Vaccine virus is of two kinds, the bovine and humanized. The first is obtained from the pock on the udder of an infected cow, and the second is obtained from a typical vaccinia vesicle from a person who has been originally inoculated from a cow pock. The virus is obtained from the liquid contained in the vesicle. The disease is now propagated on farms for the purpose of furnishing the virus in a strictly pure form. Small ivory points are dipped in the virus and are then dried and preserved aseptically, retaining their virtue for from ten days to two weeks. It is also

dissolved in glycerine and preserved in sealed capillary tubes.

The Method of Vaccination:—A point is selected, usually upon the left arm or thigh, which is rendered thoroughly aseptic. A small circumscribed area should then be so carefully denuded of the skin as not to draw blood. This is best done by an instrument with square end or point, but may be done with a lancet. A scarifier usually draws too much blood. If a drop of ammonia be confined on the skin for a few moments or a strong solution of potassium hydrate, the skin is readily removed with no pain, and the virus may be applied to the denuded surface by rubbing the charged end of a point which has been moistened by dipping in water, carefully but firmly over the denuded surface, or a capillary tube is broken and its contents spread over the denuded surface. The spot should be exposed to the air until it is dry.

A child should be first vaccinated at about the age of two years, unless smallpox is present with danger of exposure, and again every five, six or seven years. If exposed to smallpox, immediate re-vaccination should always be practiced. An infant may, upon danger of exposure, be vaccinated at birth, and a pregnant woman, if exposed, should be vaccinated or re-vaccinated at once. This protects both herself and the unborn child.

Symptoms of Vaccinia:—The period of incubation after the inoculation is about five days. On the third day at the seat of the vaccination a small papule appears, with a red areola. In three days more this becomes a vesicle filled with colorless lymph, and is umbilicated. This is tender, painful and itches. From the fifth to the tenth day constitutional symptoms develop with most of the patients. There is malaise, a slight chilliness and fever. On the following day, in severe cases, a rose-colored rash (*roseola vaccinosa*) develops over the surface of the body. By the tenth day the vesicle has become a pustule with a considerable degree of local inflammation, and the axillary or in-

guinal glands become enlarged and sore. From this period the local inflammation subsides, the constitutional symptoms abate, the pustule becomes desiccated, a brown scab will form, which becomes harder, and by the eighteenth or twenty-first day will fall off and leave a permanent characteristic scar, which is typical of the disease if not modified by local treatment.

In infected cases the evidences of direct **pus infection** are very pronounced. The pustule becomes greatly enlarged and violently inflamed, and the constitutional symptoms are severe. There is a pronounced high temperature, and sloughing may occur with circumscribed gangrene. Erysipelas is a not uncommon complication, and patients suffering from that illness must not be vaccinated until they have recovered.

Treatment:—No remedies specific to the disease as a whole are considered. In the severer cases the symptomatic indications as they appear should be met with the indicated remedies, although usually no treatment is prescribed. **Aconite, sarracenia, baptisia, phytolacca, echinacea and calcium sulphide** are most frequently demanded. Where there is marked septic infection the **tincture of the chlorid of iron** should not be neglected for newer and less active remedies. The vesicle should be protected from the first by gauze or by a shield. In the latter stage an ointment is demanded with strict asepsis. If the vesicle, after the fifth or sixth day, is treated with echinacea locally and covered with a stiff ointment of **bismuth subnitrate** and **lanolin**, it may heal up with but little scar.

Complications must be anticipated and promptly met with direct energetic treatment in accordance with their indications.

VARICELLA.

Synonym:—Chickenpox.

Definition:—An acute infectious febrile disease of childhood, characterized by a peculiar eruption. It very seldom attacks individuals above the age of puberty, and is most common before the age of ten years.

Etiology:—The exact cause is not determined, no micro-organism having been isolated. It occurs in an endemic or epidemic form, is readily conveyed by direct contact, by fomites, by food, and through the atmosphere. One attack usually renders the patient immune to subsequent infection.

The disease, from the appearance of the eruption, may be mistaken for a mild case of smallpox. And there is some difficulty in some severe cases, in making a differential diagnosis. There is no relationship whatever between the two diseases, and one does not protect from an attack of the other.

Symptomatology:—The period of incubation lasts from seven to fourteen days. In young children and in infants there is **restlessness**, fretfulness, wakefulness with a **disordered stomach**. In other children there is **bachache**, **malaise** and general **indisposition**. **Fever** occurs usually without marked chill, or with chilliness too slight to attract attention, as the first marked symptom. This at first is moderate, but will ultimately rise to 103° or 104° F. In many cases, while the child is not well, the fever does not attract attention until the eruption appears. **Small papules** at first appear on the forehead or face. These rapidly increase on the face, neck, shoulders, back and chest. Those first appearing quickly become vesicles containing serum. Each one is isolated and the skin at the base is unchanged in color and in appearance. **The eruption** is discrete, never confluent and never very profuse, and it seldom appears upon the mucous membranes. While the shape and casual appearance of the vesicle will suggest that of smallpox, at first, the distinguishing points are sufficiently marked. It

is flattened when matured, but not umbilicated, there is no induration at the base and it is superficial. Later, however, the vesicle becomes a true pock, containing an opaque serum. Upon scratching the pock may become infected and contain pus. The pocks contract and shrivel by the fourth day, crusts form and fall off, and the larger ones leave a scar closely resembling that of the smallpox scar.

The vesicles which form first, pass through all the stages to maturity and disappear while others are continually forming, so that by the third day the eruption is present in all the stages of its development.

Diagnosis:—Many cases of chickenpox appear when the child is thoroughly and effectually vaccinated. This excludes smallpox, which is the only disease it is mistaken for. The mildness of all the symptoms, especially those premonitory of the disease, are widely contrasted with those of smallpox.

The vesicles dry up quickly, are seldom umbilicated and have a dark scab. They are superficial and the base is not indurated. Chickenpox runs a short course, and terminates abruptly, in the usual health.

The disease is not a severe one or one attended with serious results. In ordinary cases the child may be confined to its bed, but may continue to play with its playthings. In frequent cases it will pass through the entire course of the disease without going to bed during the day. If the patient be reduced by some previous illness, the severity of this disease is increased. In an occasional epidemic every case will be severe, but usually without sequelæ. If the vitality is seriously impaired or if there be general infection or local infection of the skin, septicemia, or pyemia, with sloughing and gangrene, may result. Erysipelas, glandular enlargement and nephritis are the most common sequelæ.

Prognosis:—The mild character of the disease renders the prognosis always favorable.

Treatment:—In many cases the physician is not con-

sulted. Usually the tongue is coated, moist and pasty, and the mucous membranes of the mouth are pale. An alkaline remedy, as **sodium sulphite**, the **neutralizing cordial** or the plain **bi-carbonate of soda** in two or three full doses in water should usually introduce the treatment. **Aconite** in minute doses for fever will be all sufficient, unless nervous excitement be present, when a nerve sedative should be added. The kidneys should be watched and their normal action sustained.

Any complications may be met, as they appear, with the indicated remedy. They are unusual.

SCARLET FEVER.

Synonyms:—Scarlatina, scarlet rash.

There is a quite commonly accepted opinion among the laity that the term **scarlatina** designates a mild, a benign variety of this disease, and that from this variety, the same form only can be contracted. This is an erroneous and misleading opinion. The term **scarlatina** is in every way synonymous in its application with the term **scarlet fever**.

In an occasional epidemic and in some sporadic cases, a mild rash covering the neck perhaps and shoulders or appearing lighter upon the face, with a slight fever, are the only symptoms exhibited. This is termed a **scarlet rash**, but as other children will contract the disease in all its severity with all its characteristic phenomena from this mild rash it will be seen that this is only a mild manifestation of scarlet fever proper.

Definition:—An acute, highly infectious, self-limiting disease of childhood, epidemic and endemic in occurrence, exhibiting as symptoms, initial vomiting, a typical fever, sore throat and a highly characteristic eruption.

Etiology:—The contagion is supposed to be conveyed by the minute epidermal scales thrown off in the free desqua-

mation that takes place from the rash. It is also without doubt conveyed by the breath, from the excretions, from the membranes of the nose, throat and ear, or from the discharges which occur from disease of these organs induced by this disorder. Immediate contact with the infected individual is not essential, as the germ of the disease is very tenacious of life and adheres to the clothing or to any article from the room in which the patient was confined. These have been known to transmit the disease after the lapse of two, three or more years.

The disease is one of childhood and early youth, as not more than five per cent of the exposed cases in adults are attacked. In early life twenty-five per cent of the exposed cases develop the disease. It is less common than measles. Children from two to six years of age are more susceptible. Children at the breast do not readily contract it.

The disease is more prevalent in the fall and winter months, but occurs to a less extent at other seasons of the year.

Careful observation confirms the belief that the disease is not transmitted until the rash appears, and that the most actively contagious period is at the time the rash is fully developed and desquamation is established. The infection persists until the desquamation has ceased.

No micro-organism has as yet been isolated which is found to exercise an etiological influence in all cases of scarlet fever. The infection is probably of a mixed character, as both a diplococcus and streptococci of several varieties have been found.

The disease varies in severity in different cases and in different epidemics. It may exhibit only a mild rash, with a slight fever and an absence of throat symptoms, the patient not being confined to the bed. Or it may exhibit violent and serious symptoms at its onset, which increase in severity rapidly, with malignant sore throat, extreme toxæmia, enlarged glands, especially of the throat and neck, swollen tissues, delirium and sordes.

Symptomatology:—The premonitory symptoms, when observed, are marked indisposition and lassitude, dulness, headache, nervous irritability, and in small children occasionally convulsions. Anorexia and sore throat also appear. These may not last twenty-four hours, and at the most three or four days, as the period of incubation is the shortest of any of the exanthemata. After passing a restless night the patient, a short time after awakening in the morning, has a violent vomiting spell, after which he seems very weak and ill. The pulse is feeble and rapid—from 140 to 160 beats per minute in small children, small and rather hard. The fever, which may not have been previously observed, develops rapidly and reaches about 104° F. within two or three hours.

Nausea is sometimes present, but abrupt and explosive vomiting, when no nausea has been complained of, is often one of the first symptoms. In other cases the sore throat is the first symptom observed. In all cases the mucous membranes of the pharynx are engorged and inflamed to a greater or less extent, and are usually dry and irritable. The skin is hot and dry, with a burning sensation, especially when the rash appears. The eyes are bright and pupils contracted, usually as the fever develops. The tongue quickly becomes furred and there is a feverish odor to the breath.

After from twenty-four to thirty-six hours, in typical cases, the rash appears, at which time the pungent heat in the skin is intense, is perceptible to the hand and is complained of by the patient. The appearance of the rash is abrupt; spreading rapidly it covers the body and limbs within four or five hours of its first appearance. It usually appears first upon the neck, but it may appear only upon the body or hands in mild cases, or upon the chest and shoulders alone. It passes through all the characteristic stages of its development, to full maturity, in from thirty-six to forty-eight hours. The rash is of a bright scarlet color, as its name would indicate—a uniformly diffused red-

ness, which disappears entirely upon pressure, leaving a white, bloodless skin for a moment after the pressure is removed. The **eruption** is distinctly punctuated around each hair follicle, these minute points having a distinct red base, which ultimately coalesce. In some cases the appearance is that of "goose flesh." Usually around the mouth and the chin the skin is very pale, in marked contrast to the redness of the skin elsewhere.

Occasionally the disease assumes a **malignant form**, in which the skin is dark, cool, mottled in appearance, but the rash is suppressed, or appears more like that of measles, macular in character and blotched or spotted upon the skin. In these cases there may be a **convulsion** early and **mental dulness, stupor** or **coma**, resulting from uræmia or other toxæmia, may exist.

The **temperature** in scarlet fever rises abruptly within the first few hours to 105° F. or perhaps 106° F. and continues high for a period of about forty-eight hours, when, if the progress of the disease is favorable, it gradually declines for three or four days to normal, when desquamation is pronounced. The **course of the disease** is from five to eight days and its decline is marked by a fading of the rash and by amelioration of all the symptoms.

The **desquamation** begins usually in about six days, the skin becomes rough, dry and faded in appearance. The scarf skin on the face and neck separates first, in both fine scales and in large flakes. This desquamation soon becomes general and sometimes great shreds of cuticle may be removed, especially from the palms of the hands and soles of the feet. The nails of the fingers and toes are sometimes cast off also. The more severe the disease the more profuse is the desquamation. This **exfoliation** may continue from four to eight weeks, and it must be remembered that there is danger of contagion as long as there is desquamation.

Complications:—The **urine** in all cases of scarlet fever is scanty and high colored. In severe cases, symptoms of

renal congestion, with **albuminuria**, are apparent after perhaps the second day. There are various manifestations of kidney disorder. In the mildest cases the albuminuria continues and declines with the fever. In others it persists and increases after the decline of the fever, and there are tube casts present, with but few other evidences. In yet other cases, with the above symptoms, there is marked scantiness of the urine, with puffiness under the eyes or swelling of the ankles, or general **anasarca**. I have met with a few cases in which the **abdominal dropsy** alone existed, the face and extremities showing great emaciation. General dropsy is present in exceptional cases, also with marked evidences of uræmic poisoning.

So great is the work of elimination thrown upon the kidneys that **nephritis** may develop as soon as the stress of elimination becomes great, or at the decline of the fever, when the desquamation is at its height. In some cases the patient has nearly recovered, when upon some indiscretion, or from cold, a sudden and more or less complete suppression of urine occurs, as in other cases of profound septic invasion, or other evidence of acute nephritis may develop. In the larger proportion of cases it does not appear until the patient has about recovered from all the active symptoms of the disease. The fever, which has been absent for a period, reappears, but the temperature at first is not high, the pulse is sharp, quick and hard, the patient is restless and thirsty, the urine becomes very scanty and highly albuminous and usually contains blood. There is usually soreness and severe aching in the region of the kidneys. At this time dropsy, as above indicated, in its various forms may appear, or **uremia**, with **slow pulse**, **sub-normal temperature**, **hemorrhage** from the nose, **vomiting**, and generally, **suppression of the secretions**, which is apparent by very dry skin, dry, deep red mucous membranes and dry, brown tongue, with at first pronounced constipation, but with ultimate diarrhœa from the septicæmia.

These conditions so increase blood pressure that **cardiac**

dilatation occurs, with consequent valvular insufficiency, or **endocarditis** or **pericarditis** may develop. **Pulmonary œdema** is thought to be present in some cases, as sudden death is not uncommon in these complicated cases. This may result either from the œdema or from the heart complications.

A common complication is **otitis media**. The inflammation in the post nasal membranes extends upward through the eustachian tube and develops with all the phenomena of an original infection in the middle ear. This may occur early and pus developing in the cavity will escape through the *membrana tympani*. Or this disease occurring later with local distress and pain from the presence of pus, the high temperature may return and persist. This sometimes becomes a serious complication and in an extreme case the **mastoid cells** are involved, with possibly **abscess** of the brain, or **meningeal complications** may appear. Permanent **deafness** may result either in one or in both ears.

Scarlatinal synovitis, **rheumatic synovitis** or **septic arthritis** are common sequelæ of scarlet fever. They appear with characteristic symptoms, and are not difficult of diagnosis. The arthritis must be treated with measures calculated to prevent pus development and necrosis of bone.

Inflammation of the **lungs** or **bronchi** is not uncommon as a result of this disease. They occur with all the characteristic phenomena, but are more difficult of treatment, tending in their termination toward **empyema**.

Pyæmia is a serious result of the septic infection which may occur in this disease. It may be found upon post mortem examination, to have occurred from a marked kidney infection, as evidence of which minute abscesses will have become diffused throughout the kidney structure. Or the **tonsils** may be found to be the seat of the disorder, or the cervical glands may become involved to a serious extent, simulating an acute **purulent adenitis**.

In rare cases **chorea**, **ascending paralysis** from neuritis in the lower limbs, **paraplegia** or **hemiplegia** may result.

It must be remembered that the throat may be subject to **diphtheritic** invasion during the course of the characteristic inflammation and must be so recognized at once and treated specifically.

Diagnosis:—The pathognomonic phenomena of scarlet fever are so clearly marked in a typical case that a diagnosis is not difficult. These are the abrupt vomiting, with sudden high temperature, rapid, hard pulse, sore throat and the characteristic redness of the skin after about thirty-six hours, which can be pressed out entirely by the finger, leaving a very white skin, to which the redness slowly returns. The punctate eruption is characteristic. There are various forms of dermatitis in which there is a rash which closely resembles this, but all of these are devoid of the other characteristic symptoms above described. When the disease appears in its mildest forms an unmistakable diagnosis must be made and the child must be isolated, for, as has been previously stated, the infection from these cases may induce the most serious forms of the disease in susceptible cases.

There is a characteristic appearance of the tongue of scarlet fever patients which is known as the **strawberry tongue**. There is a white, thin coat at first on the surface, which is in sharp contrast to the bright red appearance of the mucous membrane and mouth. Soon the papillæ of the upper surface of the tongue become elongated and clubbed, as it were, on their tips and stand up above or through the white coating like the surface of a ripe strawberry. The tongue may become ultimately elongated, thin and pointed, but the above appearance is unchanged in the active stage.

Prognosis:—In uncomplicated cases of scarlet fever the prognosis depends largely upon the environment and the care of the patient. Under favorable circumstances, there being no dyscrasia or previous ill health, although the disease is a serious one, the patient will recover in a large majority of the cases. The mortality which statistics give

as about twelve per cent of all cases, should be reduced to five per cent by care and good treatment. In mild epidemics the mortality rate in uncomplicated cases may be nil. In severe epidemics it may reach twenty-five per cent among the younger children, but this is exceedingly rare under modern methods. Malignant scarlet fever is very fatal. Complications are to blame for by far the larger per cent of fatalities in this disease.

Prophylaxis:—Much can be done by intelligent measures to prevent the spread of the disease. Physicians are usually very careless of the fact that the infection is readily carried upon the person. A surgeon's apron should be taken to the house of the patient and left in an out-room, where it should be put on over the vest, the coat having been removed before the physician enters the sick chamber. A clean linen duster in the absence of a surgeon's apron will serve the same purpose. On leaving the chamber the physician should remove the apron and wash thoroughly in a from three to five per cent solution of carbolic acid, paying especial attention to the dampening of the hair, mustache or beard thoroughly with the solution.

A whisk broom dipped in the carbolized solution should be then used to thoroughly brush the clothes.

Other solutions are advised, or the use of chlorine gas or formalin is suggested. I have found carbolic acid solution sufficient.

Treatment:—The patient should be effectually quarantined in a large, well ventilated room, with an experienced nurse, who will carefully change her clothes before mingling with others outside. As in measles, diphtheria and other infectious diseases that are apt to affect the bronchial tubes or the throat, the author twenty-five years ago advised the volatilization of the oil of **eucalyptus**, or eucalyptus and **turpentine** in the room and to maintain a constant supply of **steam** to keep the air more than usually moist. This course is now quite generally advised. The turpentine can be dispensed with usually except in the diphtheritic cases,

but is very effectual where bronchitis with a dry irritating cough has developed as a complication.

Ten drops of one or both of the oils are dropped on the surface of water in an open vessel and this is kept boiling.

Every means must be taken to prevent the patient becoming chilled or the hands and feet or surface of the body from becoming cold, as this prevents a free development of the rash. This same care must be continued throughout the entire course of the disease to the end of convalescence in order to prevent renal congestion, which is always imminent. This threatening danger may be averted in most cases if it is never forgotten. A mild acidulated drink of an infusion of **triticum** or **marsh mallows**, or of epigea repens, will often supply an additional quantity of water to keep the kidneys flushed and to retain the mass of debris excreted, in perfect solution. This not only soothes the kidney structure, but prevents irritation and consequent congestion from the precipitation of the urinary constituents, as the phosphates and urates, etc., in deficient water. This can be iced and drunk *ad libitum* during the fever, and fruit juices, or fruit jellies may be dissolved in the infusion to impart a pleasant taste and nutritious properties.

The **food** should be liberal, but nutritious and readily digestible, or in part predigested. Milk in various forms may be given with eggs, which may be beaten together and to which, in prostrate cases, brandy may be added to advantage. Broths, gruels and jellies are of much service with toast during the fever. Upon its abatement the diet may be increased with care, including the usual articles of plain food.

The first consideration in the medical treatment of this disease is **elimination**. The author was at one time acquainted with a very successful old French physician of whom it was widely claimed that he never was known to have lost a case of scarlet fever in any epidemic, however severe. He had no hesitation in stating that his success was due to the fact that he induced perspiration as soon

as possible after the diagnosis of the disease, and kept as free action from the skin as was consistent during the entire course of the disorder. When the initial fever was established he would wrap the patient to the neck in a cool wet sheet—not cold—and then in dry flannel blankets. The result of this was a reaction and a development of warmth from the body heat and a free perspiration, which was maintained mildly for perhaps two hours. Dry clothes were then put on warm and enough covers with warm drinks to sustain a fair transpiration for some hours. If the temperature would increase and the skin become dry again within twenty-four or thirty-six hours the wet sheet was again applied. This was done during the period of the fever. The course of every phase of the disease was much more rapid than usual under this treatment, the final abatement of the fever and of the desquamation was more quickly induced. An almost entire absence of complications, especially of those of the kidneys, was the doctor's constant boast.

Notwithstanding the sentiment against the belief and the argument that it is inconsistent with the accepted theories of the origin of the disease, I have on many occasions given small doses of belladonna four or five times daily to children thoroughly exposed in a family where one was very ill from the disease, with the result that no other case occurred in the family. This I did during one severe epidemic in a family of six children where all were supposed to have had the same exposure. One was attacked. The others were treated freely, but there was no disinfection. The remaining five escaped. I invariably advise the measure as prophylactic and have seldom known the disease to develop where it was used. Its action in this line, if any, is difficult of explanation, but my own conviction is that of many others who have adopted the same course. Ten drops of the ordinary tincture of belladonna in four ounces of water, a teaspoonful before meals and at bed time, is the

proper dosage for children under ten years of age. For infants, half teaspoonful doses will be sufficient.

In any case the pulse nearly always indicates **aconite**. It is hard, wiry, sharp, staccato like and unusually rapid; from 140 to 170. A pathological characteristic of this disease is congestion, first of the skin and later of the various organs. **Belladonna** is so actively opposed to congestion that it must not be omitted. There is a marvelous harmony of action between these two remedies in small frequent dosage in scarlet fever. In no remedy is a dual action more apparent than in belladonna. With the homœopathists this is the characteristic *similimum* of this disease. Certain it is, and confirmed by sufficient experience, to permanently establish it in its position, that belladonna is of great service here. Five drops each of the tinctures of aconite and belladonna in a glass with sixteen teaspoonfuls of water should be given from the onset of the fever in teaspoonful doses every hour, or in half teaspoonful doses every half hour in cases with severe initiative. In this dose belladonna rather stimulates the secretions than diminishes them, and the aconite in every way favors increased secretion. If the skin is very dry, **jaborandi** in small doses may be given. It will increase all secretions. **Rhus toxicodendron** is indicated in this disease by the dark red or livid appearance of the skin, especially if the mucous membranes of the mouth are red and the tongue is red and glazed or narrow, pointed, and dark, with a brown coat and other evidences of typhoid with offensive breath, offensive discharges and rapidly failing vitality. It soothes cerebral irritation and controls delirium, inducing quiet and rest. There are certain eye symptoms occasionally present, when this remedy is of signal service. These are injection of the conjunctivæ, swelling of the palpebræ, extreme lachrymation and photophobia. The remedy acts in harmony with **baptisia**, which may be administered with it for the same indications, especially in *scarlatina maligna*.

Other remedies found useful in the various phases of this

disease are **lobelia**, **myrica**, **capsicum**, **ailanthus** and **sticta**. Dr. Pike a few years ago was enthusiastic concerning the action of **sarracenia**, claiming that this remedy would meet all indications alone. Dr. Peart of England gave small doses every hour of the **ammonium carbonate** in three hundred cases of this disease and claimed success in every case. It stimulated the action of the kidneys and skin and induced rest and sleep. It developed the rash readily, especially where there was a recession of the eruption.

If the above remedies are judiciously selected and free elimination is sustained from the start, especially from the skin, kidney complications will be avoided. In the treatment of the **nephritis** action must be prompt and thorough. **Heat** over the kidneys is the first requisite. This must be applied either dry or by means of a hot compress of salt and water over which a rubber water bag is placed. This must be persisted in day and night until the quantity of urine approaches the normal. This is especially required in those cases where, with no premonitory evidences, there is a sudden **suppression** of the urine. In cases where nervous irritation is great, **gelsemium** in full doses should be given unless there is depression and feeble heart action, in which case **belladonna** is the superior remedy. Prof. Whitford's specific and most successful treatment is to give belladonna and **santonin** alternately in this disease. Ten drops of the official tincture of belladonna or three drops of specific belladonna in two ounces of water in dram doses is alternated every two hours with dram doses of a mixture of twelve or fifteen grains of powdered santonin rubbed very thoroughly in a mortar with two ounces of syrup or mucilage of acacia. The influence of these remedies is prompt and satisfactory.

Dropsy is best combated with small frequent doses of specific **apocynum**, or larger doses of the distilled extract of apocynum. This latter form is devoid of the irritating properties of the first. This agent sustains the heart action to a considerable extent, but in cases of extreme failure it

should be combined with **cactus**, **digitalis** or **strychnin**, as the indications would seem to demand.

In the treatment of the throat complications the internal use of **phytolacca**, either alone or with the tincture of **capsicum**, is important. A wash or spray of **hydrogen peroxide** is excellent. I use as indicated either this or a strong infusion of **white oak bark** with **boric acid** as a gargle, or dram doses of a solution of dilute **sulphurous acid** in simple syrup, which contain from five to ten minims to the dram. The tincture of the **chlorid of iron**, from five to ten minims, largely diluted, is of value in sore throat, and for its influence on the **anæmia**, and especially if **septicæmia** or **pyæmia** complicate. If these latter conditions are pronounced **echinacea** must be given also. This remedy will be found of service in warding off toxemia from any cause.

MEASLES.

Synonyms:—**Rubeola**; **morbilli**.

Definition:—Measles is an acute, infectious, self-limiting disease of childhood, usually epidemic, seldom endemic. It is ushered in by coryza, with lachrimation, general catarrhal symptoms and mild fever. Subsequently an eruption of a peculiar character appears, which is pathognomonic of the disease.

Etiology:—This disease is of frequent occurrence in epidemic form, but the cause of its occurrence is not determined. A child must be exposed by coming into the presence of one affected, or who has come in contact with another individual having the disease. It is doubtful if immediate contact is necessary, as it is probably conveyed for a short distance through the air, and may be conveyed for a short period and for short distances in the clothes (fomites). Children not rendered immune by a previous attack—and individuals are seldom attacked but once—are very sus-

ceptible to it. Probably ninety per cent will contract it under favorable conditions. When it occurs in any family in a neighborhood it immediately spreads throughout the entire locality, but few escaping who have not been previously attacked.

No specific germ of measles has been found. During the initial stage the breath of the patient is especially infectious, but that which in the breath conveys the disease has not been discovered. The patient will convey the disease during the entire period of illness, but it is more actively infectious in the early stage, and there is no danger usually three weeks after the first appearance of the disease. The disease occurs very rarely in sporadic form, or in patients above twenty years of age, however severe the epidemic. While one attack usually renders the patient immune, it is not uncommon for a patient to have the disease twice or even three times.

Symptomatology:—After exposure a period of about nine days elapses before the patient is attacked. It varies from seven to twelve or fourteen days. The first symptoms are those of a **mild coryza**, with some **fever** and **chilliness**, with flushed face and reddened watery eyes. There is a dry, hoarse, metallic **cough** and frequent sneezing. The fever rapidly increases, the evening temperature being from one to two degrees higher than that of the morning, and by the second day the patient is acutely ill. **The throat** is irritable, red and hyperæmic, but not distinctly sore. There is usually some **headache**. **Laryngeal** and **bronchial irritation** are pronounced and rapidly increase, the **incessant cough** being an important symptom. Upon the hard palate can be seen a dotted rash, composed of distinct papules, which appear perhaps twenty-four hours before the rash appears upon the skin.

The characteristic eruption appears usually at the end of the third or upon the fourth day. Its first appearance is upon the sides of the neck and back of the ears; then upon the forehead and face. Within twenty-four hours it has ex-

tended to the shoulders, chest and arms. It then soon covers the whole body. The eruption is at first macular, upon a slightly raised, reddened base, on the surrounding white skin. It soon becomes papular and can be felt under the finger. The reddened spots then coalesce in crescentric masses, covered with groups of papules, forming at first red-dotted areas with white, unaffected skin between and surrounding them. In severe cases these groups coalesce until there is a uniform eruption over the entire surface of the body. When it has appeared upon the face, the face is swollen and distorted, and the physiognomy of the patient is altered in a characteristic manner, easily distinguishable from that induced by the eruption of any other disease. With the appearance of the eruption the fever increases and there is usually a marked increase in the bronchial symptoms. The eruption begins to disappear in the order in which it appeared, first on the neck and face, usually within forty-eight hours of its appearance. It disappears quite rapidly, and is gone by the eighth day. It leaves the skin rough, dull, of a pale bluish, mottled appearance, and a fine bran like desquamation takes place, which continues from three to five days after the eruption has disappeared.

Occasionally an epidemic of measles will assume an unusually severe form, sometimes described as **malignant**. The initial symptoms are severe, with **marked chill** and **high temperature**. There is a mental involvement and **delirium** from the first, with suppressed secretions, **dry tongue** and **dry mucous membranes**. The patient is greatly prostrated, and convulsions are common. The eruption appears very slowly, is vesicular in character or petechial and hemorrhagic. Other passive hemorrhages are apt to occur also.

Complications:—Devoid of complications, this disease has no terrors, and is quite amenable to treatment. It is the author's opinion, however, from many years' experience, that no common disorder is more liable to severe and intractable complications and sequelæ than this, and none should be watched more assiduously to avert such a ter-

mination. In a single mild epidemic, in addition to the fact that a majority of the cases were followed by unpleasant symptoms of a more or less severe character, I saw one case of convulsions; one case of immediate locomotor ataxia in a young man, from which the patient never recovered; one case of purulent infection, with multiple, deep, severe and intractable abscesses, and one case of double broncho-pneumonia, complicated with both endocarditis and pericarditis, in a boy twenty years of age.

Laryngitis, bronchitis and broncho-pneumonia, ophthalmia, otitis and diarrhea are direct complications, due to the eruption. Those complications, caused indirectly or by infection, are glandular involvement, pyemia, nephritis and diseases of the nervous system—neurasthenia, paralysis and locomotor ataxia.

Diagnosis:—If the symptoms of the occurrence of the disease are typical the diagnosis is not difficult. But there is a variation so wide in epidemics, and especially in sporadic cases, as to often render diagnosis difficult. The acute catarrhal symptoms, with watery eyes and persistent sneezing, are suggestive, and if the eruption appears duly, the diagnosis is certain. The distinct, raised, reddened and papular areas are easily distinguishable from the uniformly bright red skin of scarlet fever. The redness is not eliminated by pressure, as it is in scarlet fever. Eruptions occurring without premonitory or constitutional symptoms should never be mistaken for measles. This rule applies to very many eruptions of sudden occurrence, which disappear within a few days, or assume a chronic form. Measles always has the premonitory acute catarrhal symptoms.

Koplik described small reddish spots with a white-tipped speck in the center, which, if they occur on the buccal and labial mucous membranes from one to three days before other symptoms, are pathognomonic of measles. Their absence does not prove that measles does not exist, however.

Prognosis:—But few patients in previous good health, with proper care and environment, die from measles. With

children debilitated from any cause, acute or chronic, and especially when it follows other infectious diseases, the mortality is high. A very large percentage of the complicated cases die.

Treatment:—The practice, as often advised, of giving no medicine, because the disease is self-limiting, is radically wrong. The rule to treat every indication with its specifically indicated remedy, whatever the name of the disease, is certainly applicable in measles, as I am convinced by long observation that complications and sequelæ are averted and that aggravated phases of this disorder are relieved, the patient rendered comfortable and the disease shortened by specific treatment.

If the initial fever is accompanied by irritation of the nasal, laryngeal and pharyngeal mucous membranes, **aconite** is of the first importance, but should be given in small doses. If the nerve centers be irritated and the pupils contracted, with bright eyes, **gelsemium** will be of great service. **Euphrasia** will quickly soothe the irritability in the post-nasal membranes, and **ippecac** is indicated for that within the bronchial tubes and pharynx. From three to five drops of **ippecac** and two or three drops of **aconite** in four ounces of water, a teaspoonful every half hour or hour, for the first twelve hours, will render the symptoms mild and hasten the appearance of the eruption. This condition is brought about satisfactorily with **belladonna** in one-fourth drop doses prepared as above. This is an especially serviceable remedy if the skin be cool, the circulation sluggish and the eruption retarded, and petechial in character, and the skin be dark colored. Also if the eyes are dull and the patient dull and stupid.

If **euphrasia** is not at hand for the nasal symptoms, from ten to twenty grains of the salicylate of sodium, dissolved in four ounces of water, and the **aconite** added to this, may be all the medication indicated. The patient kept very clean and quiet, in a well ventilated and particularly darkened

room, with the above treatment, should pass through all the phases of the disease rapidly without complications.

Severe **bronchial irritation** is met with bryonia, and five-drop doses every two hours of the syrup of ipecac. If an open vessel of water, to which a few drops of the oil of eucalyptus be added, be kept simmering in the room it will afford great relief to this irritation.

The skin should have a **bath** twice daily, and should be anointed with olive oil, cocoa butter, lanolin or other unctuous substance. The patient should be kept in bed during the entire period of desquamation, and should be watched for weeks afterward and protected against chill and sudden cold to prevent lung, bronchial or other complications.

The food must be light and easily digestible and is best taken warm. Cold diet should not be administered. Milk and egg-nog in small quantities, frequently, and light broth and soup, with fruit juices, will satisfy the patient and be well received.

The appearance of any **complication** must have prompt attention in accordance with its specific indications. Tonics should be administered as needed. The simpler **iron tonics**, with **nux vomica** or **hydrastis**, or the **glycero-phosphates**, or **syrup of the phosphates**, or if lung or bronchial irritation persists, free **phosphorus** are of much service. **Strychnin arsenate** in minute doses is of much value. In cases of inanition **cod liver oil** or **malt preparations** will be needed.

RUBELLA.

Synonyms:—German measles; *rötheln*; epidemic measles; epidemic roseola; rubeola notha; hybrid scarlet fever.

Definition:—An acute, mild, contagious disease of childhood, often mistaken for measles proper, characterized by a mild fever, an eruption and a swelling of the lymphatic glands of the neck. It is usually epidemic and occasionally endemic.

Etiology:—The exact cause of the disease is unknown, no specific micro-organism having been isolated. It is conveyed by contact and by fomites and also through the air. Nearly three-fourths of all children exposed will contract the disease. It is entirely distinct and independent from measles proper, and a child may have both of these diseases within a few weeks' time, one following the other immediately.

Symptoms:—The period of incubation lasts from nine to twelve days, but the premonitory symptoms are not pronounced in character. Unlike measles proper, the rash may appear as the first conspicuous symptom, although usually malaise, indisposition, chilliness, headache and a mild fever are all present for two days at least before the appearance of the rash, and also a mild nasal catarrh, with sneezing. This is called rose rash. Often it appears on the forehead, cheeks and chest in the order specified on the third and fourth days, and characteristic rose red spots on the hard palate are seen preceding its appearance on the skin. The temperature increases preceding the appearance of the rash, with marked chilliness. The cervical glands become enlarged, irritated and somewhat painful. The eruption is at first papular, the skin then becomes red, almost scarlet, similar to the diffused redness of scarlet fever, but not as deeply red, and is not erased by pressure. Later the eruption appears like a diffused rash and does not occur in concentric masses as in measles proper. It is seldom uniformly bright on all the surface of the body at the same

time, but it fades in the order of its appearance, the early areas fading, while those later are just appearing. The rash persists about three days and then disappears, with a slight desquamation. There is not as marked discoloration of the skin as in measles proper—not that distinct roughened, dull, mottled appearance. **The throat** is sore almost from the first and usually demands special treatment.

Notwithstanding the symptoms described, the disease is often so mild that the physician is not consulted and the child is permitted to play about the house. Unless the disease appears in severe weather and the child is unduly exposed, the danger of complications is not great. **Bronchial catarrh**, and even a severe **gastric or intestinal catarrh**, may follow even mild cases. Glandular induration may persist, or in isolated cases glandular abscess may result. **Relapses**, as severe as the original attack, may occur.

Diagnosis:—The diagnosis is made by the presence of an epidemic; by the appearance of the disease in patients known to have had measles proper; by the mildness of the nasal symptoms, and early appearance of the eruption, the marked glandular complications, and more positively, by the characteristic rash, which, once seen, is always recognized. It is distinguished from scarlet fever by the absence of vomiting, the absence of severe constitutional symptoms and the strawberry tongue, and by the rash, which is erythematous and not papular in scarlet fever. With all these differential points a diagnosis is not always positively made at first.

Prognosis:—The prognosis is good. Death seldom, if ever, occurs from positively uncomplicated cases. **Bronchial inflammation**, or pneumonia, from subsequent exposure, may be difficult of treatment. The throat symptoms may become severe and hard to manage, and diphtheria has followed in a few reported cases. Complications, however, are by no means as common as with measles proper.

Treatment:—The symptoms will quickly suggest the

needed remedy. **Aconite** will meet the first indication, and given in conjunction with **belladonna** only good will result. **Phytolacca**, from fifteen to thirty minims in four ounces of water, should be given in dram doses every two hours from the start and continued into convalescence. The glandular symptoms demand this. Minute doses of **ammonium muriate** and the **syrup of ipecac** may be given early for bronchial irritation. The former remedy will facilitate the appearance of the eruption. The skin should be anointed with **cocoa butter** through the period of convalescence. It is seldom other remedies are needed. The condition of the stomach and bowels should be watched and only mild un-irritating nutritious food given. In convalescence minute doses of **quinin** and **hydrastis** should be given in a capsule to children above five years of age. One-fourth of a grain of the **carbonate of iron** may be added to this with advantage. If glandular induration persist, **potassium iodid** or **acetate** should be given with **phytolacca** and **echinacea**.

Other Infectious Diseases.

MUMPS.

Synonyms:—Parotiditis; epidemic parotitis.

Definition:—An acute contagious disease of childhood and early adult life, characterized by inflammation of the parotid glands, which may also involve all of the salivary glands, and be conveyed to the mammæ in the female, and to the testicles in the male.

Etiology:—From the beginning to the extreme end of an attack this disease is highly contagious. One attack usually conveys immunity from future attacks. No specific micro-organism has yet been discovered as its cause. The infection is conveyed by the salivary secretions by expectoration, or the breath, and may be carried on the clothing by one not subject to an attack, from a patient to a susceptible individual. It may occur in only one gland, but it usually involves both. It may be epidemic or endemic in character. Inflammation of these glands in isolated cases will occur when no epidemic exists, as a complication of pneumonia, typhoid and other serious, acute, prostrating diseases. The author treated at one time a most aggravating and intractable case, with suppuration in both glands, in a woman about thirty-five years of age, who was suffering from a severe and protracted attack of pneumonia. It is argued upon good grounds that these are cases of septic inflammation rather than of mumps proper, as in mumps there is seldom suppuration.

Symptomatology:—The period of incubation of mumps is irregular in length of time, from a few days or a week to

three weeks. **Stiffness** in the **jaw**, **swelling** in one or both of the **parotid glands**, and some **pain**, especially if anything sour is eaten, are the conspicuous symptoms. During the incubation period there is **malaise**, **headache**, **indisposition**, **nausea** and **vomiting**. The swelling, uniform in shape, increases until it fills the depression beneath the ear and extends downward, involving the neck and the space under the chin. It produces great distortion of the countenance. The temperature is usually about 102° F., but ranges from 101.5° F. to 104° F. Movement of the jaw is painful and mastication is nearly impossible. There is often ringing in the ears, **dulness of hearing**, **dizziness** and **mental hebetude**. In extreme cases there is **mild delirium**, or **nervous excitability** or **irritability**. The disease is usually so mild as to receive no attention, but it is not impossible that it become very severe, and a typhoid condition, or intractable complications, render it very serious. It continues about fourteen days.

Metastasis of this disease, at puberty or beyond, to other glandular organs is not uncommon, and may be very serious. **Orchitis** of one or both testicles is most common and is more difficult of treatment when so appearing. The metastasis occurs usually when the symptoms of the original malady are abating, with a recurrence of all constitutional symptoms in an exaggerated form. In girls the **mammary glands** may become inflamed, before as well as after puberty, and in adult life the **ovaries** and **labia** may be attacked also.

When nervous irritation is marked there may be **convulsions**, and **meningitis** has occurred also. **Pancreatitis** and tenderness in the region of the stomach is claimed to be a not uncommon complication.

Diagnosis:—The disease must be distinguished from inflammations in the alveolar process, or **toothache**, from **tonsillitis** and inflammation of the **lymphatic glands**.

Treatment:—The treatment is very simple. **Aconite** for the fever is usually the directly indicated remedy. The ad-

dition of small doses of **phytolacca**, as adapted to glandular inflammation, will usually be all sufficient. A mild alkaline drink should be given and the patient kept warm in bed. Quiet is essential to those above twelve or fourteen years of age, to prevent complications. If other glands threaten to become involved, a full dose or two of ten grains of **acetate of potassium** with a continued use of aconite and phytolacca will avert the danger. A bandage applied over the mammary glands in adult women, and a support to the testicles in men, are essential. **Libradol** mild, applied hot, or **antiphlogistine** will ameliorate all of these symptoms. Cold should never be applied to the parotid glands when inflamed. If they are simply protected from exposure that will be all that is necessary in mild cases. In severe cases hot, wet compresses may be applied for an hour or two at a time with advantage. **Acid foods** or drinks of all kinds must be avoided and the diet should be simple and nutritious. Complications will suggest the indicated remedy in each case.

WHOOPIING COUGH.

Synonyms:—Pertussis; tussis convulsiva.

Definition:—A specific highly contagious disease, characterized by a cough which is distinctly paroxysmal, the paroxysms beginning abruptly with a rapid succession of short hacks until the breath is entirely exhausted. The forcible inspiration which then occurs is accompanied by a conspicuous, prolonged crowing or whooping sound, from which the disease derives its name.

Etiology:—The disease is caused by a micro-organism, the exact character of which is as yet unknown. The presence of this, results in catarrhal inflammation of the respiratory tract and an irritation of the pneumogastric nerve. Bartholow, quoting Rosenthal, claimed that the micro-organism irritates the filaments of the superior laryngeal

nerves. The disease occurs at any age but is most frequent before the seventh year, and is thought to occur more frequently in females than in males. It is more prevalent in winter and in early spring, but will occur at any time of the year and is not uncommon in the late summer or early fall. The period of incubation is about eight days, although it varies from four to fourteen.

The disease is transmitted by direct contact with a patient while he is coughing. It is questionable if the infectious principle is conveyed in any other manner. It is thrown through the air and transmitted by the sputum directly into the face and air passages of an unaffected individual, although it is not impossible that it may be carried on the clothes. An attack of the disease usually renders the patient immune to future attacks, as it is only in rare instances that an individual will have the disease twice. The disease is probably contagious from the time the cough begins until it ceases, whether its marked characteristics are present or not, but it is more readily conveyed while the disease is at its height and during the whooping period. A child seems to be more susceptible after an attack of measles, from which fact efforts have been made to establish a relationship between the two diseases. It is probably true that the diseased membranes after measles afford a soil in which the germ of whooping cough can more readily take root.

Symptomatology:—At first there are evidences of an ordinary nasal catarrh, with a mild bronchial cough, but the fact that the cough occurs in paroxysms is not sufficiently conspicuous to attract attention. After two or three days, if the temperature be registered, it will be found that it is slowly increasing each day, though not always with perfect regularity or present at all hours of the day. The temperature will not exceed 100.5° F. or 101° F., and after from three to seven or ten days the temperature may abate. At this time, the second stage, the distinctly paroxysmal stage develops. The first stage described is called the

catarrhal stage, which may last from five to ten days. The second stage may last from one to three weeks, and is then followed by the stage of decline. As the paroxysmal stage approaches the cough increases, and will be found to be out of proportion to the other evidences of disease, which are determined by physical examination. The cough is worse at night, disturbing the sleep. Vomiting occurs from the cough and as a result of the loss of its food, the child becomes weakened, is disinclined to play and is fretful and irritable. As the whooping or distinctly paroxysmal stage approaches, the cough becomes more violent, inducing extreme redness of the face, distorted countenance and protuding eyes. If the child is lying down, upon the occurrence of the paroxysm, he will cry out as if in fear, will rise to a sitting posture and cling to any one near as if imploring help. If he is at play, he will run to his mother or nurse, being warned in time by certain premonitory sensations which are not described. The paroxysm at first is composed of a few hacks, as the lungs are probably nearly emptied of air; these are followed by a distinct whooping inspiration which is not long, but which more fully fills the lungs with air. There is then a long succession of rapid hacks until the breath is entirely exhausted, followed by a long, harsh, resonant whoop, which is followed by a cry of distress or apparent alarm and perhaps an effort at vomiting. There will be two or three such periods in a single paroxysm, during the last of which the child may cough up a quantity of glairy tenacious mucus which is with difficulty dislodged. As the paroxysms increase in severity, during the progress of the disease, the redness of the face increases until there is more or less cyanosis, with extreme fulness of the capillaries of the face and head, resulting often in epistaxis or hemorrhage from the ears, eyes and rarely from the bronchial tubes. The features are puffed, swollen and dusky in color, the eyelids swollen with extravasations of blood in the conjunctivæ and occasionally in the retina. The action of

the heart is greatly increased and the pulse becomes rapid, weak and easily compressible, especially in the later stages.

These paroxysms may occur only in the night, in the milder forms, or upon the decline of the disease, or there may be thirty or forty during a period of twenty-four hours. Between the paroxysms the child has complete rest, and in mild cases there are but few evidences of disease. The spasmodic stage in severe cases will last two or three weeks. In milder forms and in those modified by treatment, it may last only one week, or there may be but a few nights in which the characteristic whoop occurs. In other materially modified cases there may be an entire absence of the whoop, the diagnosis of the disease depending upon the persistency of the cough and by the presence of an epidemic or the knowledge of previous exposure.

In the stage of decline in uncomplicated cases all the symptoms gradually abate, the whooping ceases, the paroxysms occur with less frequency and the strength of the patient slowly improves.

Among the not unusual complications which appear, an ulcer upon the *frænum linguæ* occasionally occurs as a result of rubbing of the tongue upon the lower incisors; the heart may be weakened and in rare cases is dilated, the pulse showing corresponding weakness at all times; from failure to retain food, as well as from extreme violence of the muscular exercise, during the paroxysms, and the consequent shock to the nervous system the child becomes very weak and occasionally anemic, and occasionally leukocytosis develops with a mild form of albuminuria.

Diseases of the respiratory organs are among the most frequent complications. Bronchitis is very common in the earlier stages of this disease, and this may be quickly followed with broncho-pneumonia, and this, in a rare case, may be complicated by an attack of pleuritis. Compensatory emphysema is common from the increased respiratory efforts, and this may be followed by rupture of air vesicles and consequent interstitial emphysema. This in

rare cases is extreme and becomes a serious complication. So great is the nervous irritation in occasional cases that convulsions occur. These result in cerebral or meningeal complications, and death follows. Cerebral hemorrhage from capillary rupture has frequently occurred, resulting in paralyses which may assume the form of monoplegia, paraplegia or hemiplegia.

Diagnosis:—The pathognomonic phenomenon in diagnosis is the whoop. This, however, is often entirely absent, when the diagnosis must be made by the knowledge of previous exposure; by the presence of an epidemic, or by the intractable character of the cough—its persistence—with no apparent result from the usual methods adopted for the control of severe cough. Another evidence of the disease, is the characteristic swollen appearance of the face and eyes, the puffy edematous condition, and the discoloration of the face. While this condition in whooping cough closely resembles the same condition in measles, there is but little difficulty in distinguishing the former from the latter disease.

Prognosis:—The prognosis depends upon the age of the patient. In children under two years of age it must be classed as a grave if not fatal disease. Its gravity, however, depends largely upon the complications. Foreign statistics show a mortality of twenty-six per cent, under one year of age, and of fourteen per cent between one and two years of age. From two to five years of age the mortality does not exceed three per cent. In England the disease is ranked among the most serious of the infectious diseases, which attack the children of the poor. With care and proper treatment, and with proper hygienic environment, the mortality is greatly reduced, and in uncomplicated cases the mortality should be low.

Treatment:—The influence of remedial measures and medicines in this disease have been universally disappointing, no specifics have as yet been discovered. The use of antiseptic gargles and sprays and the inhalation of antiseptic

vapors at the onset of the disease, or during the catarrhal stage, have frequently aborted the disease or modified its character, thus confirming the opinion of its microbic origin. So common is the disease and so frequently devoid of serious complications that its gravity, its real seriousness is not appreciated either by the physician or by most people.

The patient must be confined in a warm room, with a uniform temperature, in which the air is kept constantly moist from boiling water. The course suggested in bronchitis or in croup, for generating large quantities of steam at regular intervals, is available where the room is heated by a furnace. This is done by dropping a hot brick or a piece of red hot iron into a wooden vessel of boiling water. To this a small piece of **unslaked lime** may be added or an ounce of vinegar, or a few drops of the oils of **turpentine** or of **eucalyptus**. This is an important measure and must not be neglected, as it will greatly decrease the paroxysms and conduce to easy and sufficient respiration. In the initial stage of the disease I have used **belladonna** with better results than any other remedy. The benefits of this agent in this disease have long been recognized. I administer a mixture made by adding ten drops of the official tincture to four ounces of water, in dram doses every hour, to children above five years of age. In younger children it should be given in half-dram doses. Where the secretions are deficient, and especially in older children, it may be given in the **syrup of tolu**. Where the secretions are excessive, I give it in larger doses every two hours, alternated every hour with one grain of **alum** dissolved in simple syrup, **syrup of tolu** or **wild cherry**. This has given me the most satisfactory results.

In those cases where there is much nervous excitability, with violent paroxysms, the **bromids** will be serviceable. If there is much heart weakness, the **bromid of ammonium** may be given, but usually the **bromid of sodium** will produce the most desirable results. **Asafœtida** has had an excellent reputation in the past for this class of cases, as it

exercises a sedative effect upon the nerve centers. **Lobelia** has been advised, and there is no doubt that if we were able to distinguish carefully we would find a class of cases in which this remedy was superior to others. It must be given in small doses, frequently repeated, and no nauseating influence must be produced. **Castanea vesca** has been lauded in the past, but little proof is recorded as to its efficacy. **Drosera** will control the cough in a few cases, but its influence, however, is more apparent upon the after cough. It terminates the paroxysms and leaves the patient free from cough, materially assisting in the upbuilding of the patient. It has been given during the entire progress of the disease, when the bronchial secretions were deficient, with the result that the paroxysms occurred less often and were materially modified. The **camphor monobromate** is a remedy of much service where there is nervous irritability with extreme sensitiveness, and where there is nausea and extreme restlessness, with persistent fulness of the cerebral circulation, especially if the extremities are cold, it will give good results. From one to three grains may be given every two or three hours. A remedy that was quite popular among our older physicians was **nitric acid**. With these patients the mucous membranes are often dark red, and the secretions are deficient; if the tongue has a peculiar deep red or carmine color the agent will act to a better advantage. The acid may be added to syrup, in the proportion of one dram of the officially dilute acid to four ounces of syrup. This may be given in dram doses in a little water every hour or two.

Jamaica dogwood is advised, in doses of from two to five minims, every two hours. I have not had an opportunity to thoroughly test it. If it is possible to administer quinine to patients suffering from this disease, there are cases which seem to be satisfactorily influenced by this remedy. It can not be given to infants with advantage.

The inhalation of antiseptic vapors has accomplished good results in this disease. The vapor of **eucalyptus** is in

common use, and patients have been subjected to the inhalation of ordinary illuminating gas and to an atmosphere which has been previously charged with a small quantity of sulphurous acid gas. The use of **carbolic acid** or **peroxide of hydrogen** in the form of a vapor, used with an ordinary vaporizer, are of service.

DIPHTHERIA.

Synonyms:—Malignant sore throat (*angina maligna*); diphtheritis.

Definition:—An acute infectious disorder, characterized by great prostration, a serious throat inflammation with an exudation and the formation of a false membrane.

Etiology:—The immediate exciting cause is the Klebs-Loeffler bacillus, which is deposited in the mucous membrane of the fauces and in the follicular structure of the tonsils. The bacilli do not become absorbed, but develop upon the membranes, inducing a specific inflammation, which results in the formation of a croupous or fibrinous membrane, which covers the structures, penetrating all the layers of the mucous membrane, causing the membrane to pass through a process of disintegration, or necrosis. In the processes of the growth and nutrition of this specific organism a toxin is produced which being immediately absorbed, produces the constitutional effects which are the serious factors of this disease.

This infective principle of the disease is transferred from one patient to another in many ways. There is direct infection from the breath of the patient, or from coughing, the germ being thus thrown through the atmosphere. Anything that is brought into immediate contact with the patient will carry the germ also. The bacilli are very tenacious of life, as they have been found to be virile months after the patient has recovered.

It has been determined that cats, dogs and birds, as well as rats and mice, will contract the disease, and from them it is conveyed to children, an entire family having been so inoculated.

That form of diphtheria which presents the essential characteristics of the disease, but in which the Klebs-Löffler bacillus is not found, is known as **pseudo-diphtheria**. In this form the streptococcus is usually found present.

Children from two to seven years old are the most susceptible. At twelve years of age the liability of infection is at its maximum. From puberty to adult age the liability decreases, until after twenty-five years of age immediate direct infection is necessary for the conveyance of the disease, and even then, one exposed may escape. An individual worn down with exhaustion, or with previous disease, or surrounded with an unhygienic environment, is especially liable to infection. Exposure to cold and damp is especially provocative, the disease being much more frequent in cold weather and in cold climates. It is seldom seen in the tropics. Epidemic outbreaks are found to depend upon the presence of organic matter in the drinking water and upon the decomposition of organic matter with defective drainage and markedly unhygienic conditions.

Symptomatology:—The period of incubation, depending somewhat upon the degree of infection, is from two to eight days. During the last two days of this period the prodromal symptoms—malaise, indisposition, aching and some chilliness—are apt to appear, although the onset in some cases is rather abrupt. The throat is at once complained of, with the chill. The fever rises quite rapidly, soon reaching 103° F. It has not the sudden high rise of some of the other infectious diseases, as the infection is progressive in its development. There is a wide difference in different cases; some are most violent at the onset, developing the entire train of classic symptoms within six hours, while in others mild symptoms may prevail for two or three days, the child playing around the house, before the real character of the

disease is discovered. It is common for parents to pay but little attention to a mild sore throat while the child is able to be about, and because of this neglect the disease develops fully before the physician is called. A single small patch first appears, usually upon one tonsil. It is shaped like a grain of wheat and is grayish and sunken, with a narrow bright red areola of inflamed tissue. It sometimes forms on the posterior surface of an enlarged tonsil, or between the tonsil and the fauces. This patch rapidly increases in size, and the characteristic fetor of the breath appears. It assumes more of a dirty gray color and quickly spreads, involving both tonsils and the fauces. The edges are ragged and the approximate tissues are intensely red and angry in appearance.

In cases where no attention has been paid to the complaint of a sore throat, the entire throat may be covered with the exudate, when first examined, and it may have advanced to the anterior surface of the anterior faucial pillars and hard palate, or it may have filled the nasal passages. In other cases it develops on the post nasal membrane, and occludes the nasal passages before its real character is discovered.

An excoriating discharge from these passages may appear before it is known that the disease is present, and such a discharge should always be looked upon with suspicion. When the post-nasal passages are involved the constitutional symptoms are usually very severe and unmistakable.

With development of the membrane on the tonsils or upon the pharyngeal walls, the glands in the neck at the angle of the jaw become enlarged and often tender. This is not common in tonsilitis, nor in the non-specific forms of sore throat.

The symptoms of constitutional involvement increase as the toxins are elaborated and absorbed. This occurs more or less rapidly, according to the severity of the infection. The temperature increases, the pulse becomes rapid, and perhaps irregular, and prostration occurs and increases rap-

idly. While the patient is usually dull, with perhaps a mild delirium, restlessness is almost invariably present, with signs of distress and general discomfort, the patient appearing severely ill. Convulsions seldom appear.

Laryngeal Diphtheria:—When the diphtheritic exudate is formed first in the larynx, the throat appearances may not be suggestive until difficult breathing, with hoarse metallic croupal cough, appears. I had an experience in my early practice, in 1876, with an epidemic of diphtheria of a severely malignant type, in which obstruction of the respiration was the first apparent symptom in all cases. There was no cough, but labored breathing, with intensely fetid breath and feeble, irregular and very rapid pulse. Within twelve hours the exudate would cover the throat, and if death did not soon occur, would extend to the post nasal membranes. This was the history of perhaps two hundred and fifty cases. The mortality was very great. Post-mortem examination in several cases showed a uniform rapid spread of the membrane downward, into the ramifications of the bronchial tubes, apparently completely obstructing the minute tubes, as well as the larger ones.

With the increase of difficulty in breathing in laryngeal diphtheria, the restlessness of the child increases. It tosses and cries out in sharp, distressed cries, and grasps the throat or appeals for help. Soon the face becomes pale and livid, and covered with a cold sweat, and ultimately cyanosis appears. The characteristic harsh, ringing, metallic cough is more frequent and distressing at first than after the disease has progressed some hours. The constitutional symptoms are not so severe nor so characteristic, when the larynx alone is invaded, as the absorption of the toxins takes place more slowly, the child dying from respiratory obstruction often before they appear, but the local symptoms are very alarming and demand instant relief, as suffocation seems imminent.

Albuminuria is so constantly present in diphtheria that it should be given as one of the symptoms of the disease

rather than as a complication. If the infection is sudden and rapid, albumen will be found present on the second day, and the quantity is apt to increase in proportion to the increase in the severity or malignancy of the disease. The urine will decrease in quantity, although dropsy is not common, and tube casts, both hyaline and granular, will ultimately prove the presence of a true nephritis.

A **rash** is sometimes present in diphtheria, so closely resembling that of scarlet fever as to render a symptomatic diagnosis difficult. I have seen this rash exfoliate similarly to that of scarlet fever. Purpura and cyanosis appear in malignant cases.

Nasal hemorrhage, persistent and intractable, is a common complication, and this of course increases the anemia by reducing the quantity of the blood.

In cases that terminate favorably, there is an improvement in the symptoms about the fifth day. The membrane shrinks and separates at the edges and becomes thin and dark in hue. It leaves a red, raw, irritable surface, which is very sore and tender and bleeds readily. As the active symptoms abate, the patient exhibits extreme weakness, and anemia is apt to appear. As convalescence advances these two symptoms will be most apparent. Difficulty of swallowing—**dysphagia**—is apt to occur early, as a result of local paralysis, during the active stage of the disease. Because of this, as sufficient food cannot be swallowed, the nutrition of the patient, which is of the greatest importance, becomes a serious problem.

Heart complications are common, whether from paralysis or from direct failure from extreme exhaustion. Sudden death has occurred in many cases, after diphtheria, when convalescence was thought to be advancing favorably. A sudden exertion, or rising quickly to a sitting posture, has been followed by death. There is doubtless disturbance of the nervous mechanism of the heart, as of the vagus, due to the severity of the disorder.

Nervous disturbance is shown in various ways. Multi-

ple neuritis or paralysis of the ocular muscles, or of the ciliary muscles, are not uncommon. General paralysis, or locomotor ataxia, has resulted.

The patient usually recovers readily from these nervous complications under positive tonic and restorative treatment, and with the use of electricity. The restoration of the red blood corpuscles—the overcoming of the anemia—must be accomplished conjointly with the treatment of the nervous condition. **Otitis media** from extension of the disease through the eustachian tube, and deafness from paralysis are occasional sequelæ. **Capillary bronchitis**, **pneumonia** or **bronchopneumonia** follow laryngeal diphtheria in occasional cases.

Diagnosis:—An experienced physician will observe in the first stages of diphtheria certain conditions which underlie all the symptoms, which are difficult to describe, and yet which occur to him intuitively as evidences of this disease. An immediate diagnosis is of great importance, at the same time an absolutely correct diagnosis is essentially difficult, and in no disease are errors of diagnosis more common, when made independently of the microscopical evidences.

It was the author's invariable plan, before this method was adopted, to treat every questionable case of throat disease, from the first, as if it were a severe case of diphtheria.

A bacteriological examination of a smear preparation of the exudate will show the presence of the Klebs-Loeffler bacillus, in all cases of true diphtheria. It should be made when the membrane is forming and where no antiseptic has been used. In failure to find the bacillus upon the first examination, repeated examination should be made.

In follicular tonsilitis, a differential diagnosis is extremely difficult from appearances alone. Usually the exudate is very white, thin, and uniformly distributed over a considerable area of the tonsils, and is quite readily removed. The severity of the constitutional symptoms of tonsilitis

is nearly as great at the onset as are those of diphtheria. In other ulcerative conditions of the throat the exudate is whiter and soft and does not adhere so tenaciously to the mucous membrane.

Prognosis:—Without specific treatment, the mortality of this disease is very high. The use of antitoxin by the municipal authorities of the large cities has so greatly reduced the mortality that the disease is no longer dreaded. Those cases that involve the post-nasal membranes, or the larynx, as has been stated, are much more severe in their manifestations, and are more difficult to cure, even with the most approved methods.

Treatment:—The use of antitoxin in the treatment of diphtheria has become so universal and is so satisfactory to the profession at large, that all other measures are neglected. In the text books of the regular school almost no medicinal treatment is given. This, in our opinion, is a positive retrograde movement in therapeutics. The work of the past half century has certainly not been without results in the advancement of our knowledge of the treatment of this disease, and this knowledge must not be lost. A rational method of treatment is certainly one which is conducted in line with the physiological and therapeutic action of reliable remedies, administered in the line of the rational treatment of other diseases, and our own observations, and the experience of ten thousand of our physicians have proven that from ninety to ninety-five per cent of the patients can be saved by the proper medication, except in malignant or laryngeal cases, where the mortality is higher.

It is the universal opinion of our observers that aconite and *phytolacca* have a positive influence in combating the progress of this disease, and in inhibiting the advancement of the inflammatory process, and the absorption of the toxins, as well as in exercising a positive control over the temperature. These two remedies should be given from the first, but the use of a powerful internal antiseptic must

accompany them. Five drops of **echinacea** should be given with each dose.

From the first a remedy must be used for its contact influence upon the developing membrane. In the writer's opinion, the most effectual remedy for this purpose is **sulphurous acid**. This acid, officially dilute, in properly adjusted dosage is comparatively non-toxic, and can be prescribed in a form that is palatable, and which will be readily taken by any child. The following is a favorite prescription with me: Sulphurous acid dilute, two drams; flowers of **sulphur**, one dram; syrup of **acacia** and simple syrup, of each one ounce. Mix; give from one-half to one teaspoonful of this every half hour, or hour, for the first twenty-four hours to a child above five years of age. To a younger child it is well to give the smaller dosage frequently for perhaps three or four hours, and then discontinue for two hours to begin again, examining the throat once in from four to six hours to observe the progress of the development of the membrane. This prescription should be taken without being diluted, and no water should be drunk immediately afterward. It is surprising how rapidly the exudate will disappear under the action of this remedy.

With older children it has been my plan to apply with a camel's hair pencil, at the very start, a few drops of the tincture of the **chlorid of iron** to the beginning exudate. With infants, the use of a spray of the **peroxide of hydrogen** is of much importance in keeping the parts cleansed. It should be thoroughly sprayed into the nasal passages as well.

A course of treatment based upon the use of a solution of the **chlorate of potassium**, to which is added the tincture of the **chlorid of iron**, was very popular among the older physicians. A solution which contained about two grains of the chlorate with six or eight minims of the chlorid of iron to each dram, was given in dram doses every two hours.

In a very severe case of nasal diphtheria, some twenty-five or more years ago, I conceived the idea of clearing the passages of the exudate by the use of the oils of **eucalyptus** and **turpentine**, suspended in hot water in a steam vaporizer. The results were so highly satisfactory in every case used, that I wrote a description of the method and published it. Since that time this course has had quite general acceptance. It is a good plan also to keep an open vessel containing water, to which a few drops of these oils, combined in equal parts, are added, simmering over a fire in the room. For laryngeal diphtheria the patient should be made to breathe a strong vapor of water in which fresh lime is slaking, confined by a proper hood; this should be continued from fifteen to thirty minutes, about once in three or four hours. With some practitioners the use of **iodized calcium** (calcidin) is becoming a popular method in membranous croup. The membrane is loosened and separated rapidly and the strength of the patient is conserved, and yet its efficacy in true diphtheritic laryngitis has not been conclusively proven. A mixture of equal parts of specific **jaborandi** and specific **echinacea**, administered in doses of from five to eight drops, will do much toward loosening and assisting in the exfoliation of the exudate.

An internal remedy of much importance, when specifically indicated, is **rhus toxicodendron**. The indications are those usually described—a very red, narrow, thin and pointed tongue, reddened mucous membranes, with a tendency toward those appearances which resemble a typhoid condition. **Baptisia tinctoria** is indicated where there is dusky discoloration of the tongue and mucous membrane, with dull or purplish discoloration of the face. **Belladonna** antagonizes local congestion, and if given in minute doses, during the early part of the treatment, it will greatly enhance the influence of the other remedies. **Capsicum** is of excellent service in the restorative process, after the exudate has disappeared, and where the pharyngeal mem-

branes are of a dark red or purplish color. **Echinacea** antagonizes the influence of the toxins, and prevents their development within the system. It preserves the integrity of the blood and stimulates the processes of absorption and the appropriation of nutrition. **Hamamelis** is indicated where there is great relaxation of mucous membranes with an inclination to hemorrhage. **Hydrastis** should be used as soon as any tonic treatment can be introduced. Its general tonic influence upon the nerve centers, upon the heart and stomach, and intestinal canal, is of great importance. **Phytolacca**, in addition to the influences described, acts in harmony with **echinacea**, but specifically antagonizes the development of inflammation of the glands. In the treatment of threatened heart weakness, and anticipated failure, we have no remedy equal to **cactus**; it should be given through the entire period of convalescence, and may be introduced early in the disease, if indicated. It certainly operates directly upon the nutrition of the heart, it strengthens the muscular and nervous structure of that organ, and antagonizes the depressing influence of the toxins, and if given in conjunction with **avena**, or later with **strychnin** or with the **arsenate of strychnin**, it will prevent paralysis or correct existing paralysis.

Antiseptic measures are of primary importance in this disease. Among those which we have named, **salicylic acid**, **mercuric chlorid**, **formaldehyd** and **potassium permanganate** have been used with good results.

The use of **antitoxin**, the anti-diphtheritic serum, has reduced the mortality of diphtheria in all cases reported from fifty to perhaps sixty-five per cent. Taking into consideration the very large number of cases treated in the past ten years, the agent has produced serious results in comparatively few. The facility of its administration, its undoubted prophylactic influence when given early, and its influence in malignant cases which are apt to run a course too rapid to be influenced by the action of internal medicines all argue strongly in favor of its adoption in cases that

are at all severe in character, if true diphtheria. The milder cases of diphtheria and all severe cases of sore throat, in which the Klebs-Loeffler bacillus is not found, should be treated with the specific measures here advised. Antitoxin is especially applicable, and I believe should be used without hesitation in those cases that have developed the severe and dangerous symptoms of the disease, when the physician is called and which have had no preliminary treatment. It should also be used where marked and dangerous laryngeal symptoms appear, whether there has been preliminary treatment or not.

Where employed alone, the best results have been obtained when it was used early in the attack. It is advised that a few full doses be given at the onset, as they are considered of more value than repeated small doses. The full initial dose of this remedy is two thousand units. This should be repeated in about six hours. In the markedly severe cases from twenty-five hundred to three thousand units should be used.

When convalescence is established, forced feeding with concentrated highly nutritious food must receive first attention. For the first week the patient should be kept in a recumbent position most of the time, and but little physical exercise should be allowed. Later, as the strength and general health improves, the amount of physical exercise may be increased. The condition of the heart and nervous system should be taken into consideration in determining the amount of physical exercise. As anemia is nearly always present, measures which will most rapidly restore the red blood corpuscles must be correctly adapted to each individual case. Attention must be paid to the action of the kidneys. Any irritation of these organs must be relieved and congestion carefully overcome. The application of dry heat for an hour or two, two or three times each day, will be of much benefit in restoring the normal functional action of these organs.

ERYSIPELAS.

Synonym:—St. Anthony's fire.

Definition:—An acute endemic and epidemic disorder due to the presence of the streptococcus erysipelatis, now believed to be identical with the streptococcus pyogenes, manifesting itself by a characteristic inflammation of the skin and subcutaneous tissues, which, although distinctly circumscribed, spreads rapidly. The inflamed area is deeply red, hot and painful. There is a moderately high fever and some prostration.

Etiology:—The distinction, which was once supposed to be established between the streptococcus of erysipelas and the ordinary pus-producing streptococcus—the streptococcus pyogenes—is no longer recognized. The specific origin of the disease is therefore denied.

The disease develops most commonly upon an abraded or broken skin. I have known, however, of several cases of facial erysipelas which started from the same spot, where no abrasion could be found, and almost on the same day of the same month, on several successive years. The disease is commonly endemic. Epidemics depend upon a distribution of the infection, which can usually be determined and explained. This is true in hospitals and in other institutions where invalids are congregated. It is carried by a careless midwife or obstetrician from a typical case to puerperal patients, resulting in quick infection. It occurs most commonly in winter and in the early spring months, and among those of previously impaired health, or those who are exposed to severe weather. It is more common in damp weather and among male patients and readily attacks wounds and injuries that have not had strict attention and care. It is more frequent between the ages of twenty and thirty years. Nearly forty per cent have had previous attacks, and it is not uncommon that it recurs three, four or five times. Alcoholics and patients suffering from tuber-

culosis, Bright's disease, diabetes mellitus, or other cause of permanent health impairment, are especially liable to infection. Puerperal cases are readily infected.

Symptomatology:—In erysipelas the prodromal symptoms extend over a period of from two to seven days. A sense of general ill feeling, with **headache**, precedes an attack, with restlessness, a **slight fever**, some irritation in the throat and a **mild cough**. The **appetite** is gone and there is **constipation**. The onset varies in different cases; with some there is a sharp **chill**, an abrupt rise in the temperature and **rapid pulse**, prostration and some **delirium**. With others there is **burning**, tingling, and perhaps itching, over a given spot on the surface of the skin, usually on an exposed surface of the face or head. This is most often at the side of the nose, but it may be on the cheek, ear, forehead or scalp. In one of the author's cases it appeared on the outer surface of the upper arm, immediately below the shoulder. The patient may be yet about his work, while feeling indisposed. A **distinct redness** then appears at this point, which soon becomes hot, hard, painful and shining. This spreads rapidly and there is soon apparent a distinct line of demarcation between the healthy and the inflamed surface.

The patient now has a succession of chills, and the temperature rises to perhaps 105° F. As the inflamed surface is swollen, this is raised above the healthy skin, and the line can often be felt as well as seen. This line advances as the inflammation advances. In some cases—those most active usually—with marked constitutional symptoms, the color is deep red and the surface is **shining**, but where the onset is less rapid the color is of a dull, dark red, or dusky hue. This inflammation involves the integument and cellular tissues beneath, into which there is often infiltration. This produces great distortion of the face and countenance. The eyes are closed and their location almost obliterated, the ears are enlarged and forced out of their usual position. When on the tip of the nose, the appearance is almost hid-

cous, and the pain and distress are unbearable because of the unyielding character of the structures.

In those cases known as **erysipelas migrans** the inflammation may change its location and progress down the arms, or onto the other portions of the body and abate at the point of original invasion. By this course it may successively attack almost the entire surface of the body before it is under control. This, however, is a rare form. In some cases the epidermis is separated and **blebs**, **blisters**, **vesicles** or **bullæ** may appear. Occasionally these ultimately fill with pus or pus may form beneath the entire integument in the cellular tissue or from the intense infiltration gangrene may develop with distinctly marked outlines.

The constitutional symptoms become aggravated as the disease advances, and by evening of the third day, in severe cases, the temperature may have risen to 106° or 106.5° F. In the latter part of the night the temperature falls two or three degrees, and during the remission there is a slight abatement of the symptoms. In the migratory form of the disease the **temperature varies** greatly on different days and at different times on the same day, the pulse continuing full and soft. Just before the fever begins to decline there is a fading of the extreme redness of the skin, and an **abatement of all the phenomena**, although in extreme cases occasionally there may be slight increase of the local symptoms, even after the temperature has reached the normal point.

There is extreme **nervous excitability** and **restlessness** in some cases, while in others there is **dulness** and **inactivity**. Severe **headache** is common, and some **delirium**, especially during the early or middle part of the night. In drunkards **delirium tremens** has been precipitated by an attack of this disease. As the symptoms persist marked deterioration of the blood occurs, and in a small percentage of cases **typhoid phenomena** develop, with dry, dark coated tongue and dark mucous membranes of the mouth and **sordes**.

There is a form of **erysipelas** in which there is extreme

swelling and œdema of the surrounding tissues, which may be filled with pus, with sluggishness of the local circulation and perhaps discoloration. This is designated as **phlegmonous erysipelas**. There may be frequent and persistent relapses in this disease, and it may be present in a child at its birth, when it is known as **erysipelas neonatorum**.

An attack of erysipelas confers no immunity to the patient, but rather predisposes him to a recurrence of the disease.

Complications and Sequelæ:—The occurrence of phenomena designated as typhoid, is due to general **septicemia**, which develops early in some cases and is a serious factor. The presence of **albumin** in the **urine** is very common. **Abscesses** are the rule in badly managed cases, rather than the exception. **Rheumatism**, occurring from four to six days after the development of the disease, and persisting even after the local symptoms have abated, is of not infrequent occurrence. Involvement of the lung structures, inducing **pneumonia**, **bronchitis** and **pleuritis**, may occur also, and **endocarditis** and **pericarditis** have been induced, also **synovitis**, **nephritis** and **cystitis**, as well as **iritis** and **otitis media**.

When **chronic disease** is present in patients attacked with erysipelas the chronic condition may suddenly assume grave proportions and terminate fatally. In patients impaired in health the disease is liable to be more severe and protracted—less amenable to treatment.

Prognosis:—In patients of previous good health and those suffering from the first attack the prognosis is good, as the disease in these is not difficult to manage. It is the complicated cases that assume serious proportions, and those occurring in patients of previously debilitated constitution.

Treatment:—It is the author's practice to pay the first attention to the temperature and pulse at the onset of the disease. **Aconite** and **veratrum** may be used with excellent results in small and frequent doses. The latter remedy may be spread over the local reddened and inflamed surface with

a camel's hair pencil. Its internal specific indication is a red stripe down the center of the tongue.

The directly specific remedy is **rhus toxicodendron**. If the local symptoms are sharp and conspicuous and the temperature is not too high, this alone will meet the indications satisfactorily. It should not be omitted and its use will establish confidence in its influence. Five drops of specific rhus in three ounces of water is given persistently as long as the circumscribed bright redness remains, in hourly dram doses. The remedy is especially indicated when with the bright redness there is vesicular eruption. When the redness is darker, the **tincture of iron** in ten minim doses every three hours is indicated. In my early practice I invariably painted the inflamed surface and an area of the healthy skin, perhaps half an inch wide outside of and beyond the line of demarcation, with this remedy in full strength. I have had no better results from other remedies.

When the case is deeply seated, or when it involves the pleura or the peritoneum, or when rheumatic symptoms or symptoms of synovitis occur, **bryonia** will be sharply indicated and should be persistently given. Muscular aching and diffused soreness will abate under the influence of small doses of **macrotys**. **Belladonna** in small doses is sharply indicated in many cases of this disease, especially if the surface is of a dark but dull hue and smooth and shiny. Its influence upon the capillary circulation in phlegmonous cases is most pronounced and satisfactory and in a direct line with the physiological action of the remedy. It overcomes local stasis and induces equalized capillary circulation. **Apis mellifica** is indicated where there is much tumefaction and edema, especially if the urine is deficient, of high specific gravity and of dark color, with irritation and some sharp pain in its passage.

When the symptoms have abated, the temperature not above 100° F. and the skin and tongue moist and soft, the tongue cleaning, **quinin** will be of much service in support-

ing the strength of the patient and in re-establishing the functional action of all organs. It can be given in conjunction with the **tincture of iron** with good results.

In cases that have had a sudden sharp onset, with pronounced symptoms, in previously strong, vigorous patients, a hypodermic injection of **pilocarpine** at the onset will often abort the active phenomena. This may be repeated once or twice within the first eighteen hours if the temperature is high, but should be abandoned after the first day. If delirium is present at the first, this remedy is especially serviceable. **Echinacea**, locally and internally, will be of immense service in septic and phlegmonous cases and where the phlegmonous tendency threatens. It is the remedy also for gangrenous cases and where abscesses have formed whether mild or severe. Gauze wet with this remedy should be applied over the diseased surface and retained, covered with rubber protective. From ten to twelve drops internally every two or three hours will destroy sepsis within the system and greatly inhibit pus formation, when such a tendency exists. Where the local manifestations are extreme the agent can be injected directly into the structure toward the outer margin with pronounced results.

For the nervousness and sleeplessness **gelsemium** and **hyoscyamus** are accessible, or small doses of **chloral** or **sodium bromid** in full doses with or without very small doses of **morphin**. A prescription, each dram of which contains five grains of the above bromide and one-sixteenth of a grain of morphine and one minim of specific hyoscyamus may be given in dram doses every half hour, for two hours, and then discontinued. Three or four doses are usually sufficient. This produces freedom from pain and distress and quiet sleep, with none of the untoward symptoms of the morphin. Further external measures are the application of a carbolic paste or a lanolin ointment containing **boric acid**, carbolic acid, **ichthyol** or **bismuth subnitrate**. The use of a wet gauze boric acid dressing confined with oiled

silk or rubber protective will act promptly. Or a dilute solution of sulphurous acid is often of much service.

Other general constitutional symptoms will be met according to indications. Typhoid conditions will need **baptisia** or **turpentine** or **hydrochloric acid** in addition to some of the remedies named, especially **echinacea**.

The diet should be generous, concentrated, very nutritious and easily appropriated. A **salt water sponge bath** is efficacious, especially while the fever is present. Cold sponging at this time is among the available measures. Complications, as stated, must be met as indications suggest.

INFLUENZA.

Synonyms:—La Grippe; epidemic catarrh; epidemic catarrhal fever.

Definition:—An acute disease, highly infectious, epidemic, endemic and pandemic, characterized by febrile paroxysms, intense aching, muscular pains and often a bursting, almost unbearable frontal headache, involving the orbits, and the upper nasal region with catarrh of the respiratory passages and of the digestive tract, and exhaustion of the nervous system. It is further characterized by the occurrence of erratic and unanticipated manifestations, and by grave complications and intractable sequelæ. The bacillus of Pfeiffer is found present in all true epidemic cases.

Etiology:—There is much uncertainty as to the cause of the sudden appearance of prevailing epidemics of this disease in different parts of the world almost simultaneously. There is no known influence that could convey an infectious micro-organism from individual to individual, and from one locality to another, widely distant, in the time these epidemics burst upon different parts of the world. While the bacillus of Pfeiffer is found universally present

in these epidemics there is an argument in favor of the belief that it is an accompaniment of the disease, a product of the disease processes, rather than that it is the cause. That the disease occurs at other times in an endemic or pseudoepidemic form with all the severity, with all the intractable phenomena and fatal complications and sequelæ of the pandemic cases, when the bacillus of Pfeiffer is not found, is undeniable.

There are certain atmospheric influences present that induce individual susceptibility. In 1890, when the epidemic burst upon the United States in the months of January and February, there was what is known as an open winter. There was no ice nor snow. There was prevailing chill, rain, damp and fog. It has been observed that at other times there were but few, if any, cases, as long as frost and steady clear cold weather prevailed, but upon the appearance of thaw, rain and persistent damp, chilly, cloudy weather a widespread epidemic has suddenly appeared. Atmospheric, climatic or obscure telluric conditions have certainly an influence in epidemic outbreaks.

At the time an epidemic of influenza prevails there is an almost complete absence of other infectious and epidemic disorders, but individual cases of this disease will occur as complications or as the sequelæ of other infectious diseases, as secondary infection. Age has but little influence in the spread of the disease. Infants and those advanced in years, with those also of middle life, are attacked, but those feeble and previously indisposed are more susceptible, especially the aged. Attacks of the disease bestow no immunity from future attacks, and certain individuals appear to become susceptible to its influence and suffer from it repeatedly.

Symptomatology:—The symptoms of the disease vary greatly with the general character of the epidemic, the atmospheric conditions and the susceptibility of the patient. The onset usually is sudden and without warning. There

is a **chill**, a quickly rising **temperature** and simultaneously a **bursting headache** or extreme **muscular aching**, amounting in many cases to pain, especially in the deep muscles of the back and across the loins. **Congestion** and engorgement of the **mucous membranes** of the **nasal passages**, with a sensation of fulness, pressure and distress or pain across the face and through the orbits at the root of the nose is quite common and it is frequently accompanied by a profuse watery discharge, with lachrymation. The fever usually reaches a high point— 104° F.—quickly, and remains there for two or three days with but little variation, but in an occasional case the temperature does not rise above 101.5° or 102° F., where it may remain persistently for many days.

The patient is quickly **prostrated**, and presents all the evidences of severe illness. If the physician was not aware that the disease is self-limiting, and if uncomplicated, is usually harmless in its results, he would anticipate the approach of some fatal malady, so violent are the initial manifestations. There is **restlessness**, **insomnia**, depression of spirits or **mental hebetude**, dullness, and in some cases **delirium**. If there are no complications, no further involvement of organs or viscera for two or three days, the symptoms will abate as abruptly as they appeared, and within a few days more the patient, with the exception of extreme and apparently **unwarrantable weakness**, will have regained his health. But it is rare indeed that other organs do not become involved.

The respiratory organs are most frequently affected, and bronchial or pulmonary congestion, with bronchitis or pneumonitis, are apt to develop. Any disorder whatever developing as a complication of influenza is apt to be greatly intensified in all its phenomena—more severe and intractable than if it appeared alone. And any inflammatory disease that is complicated by the appearance of the phenomena of influenza is greatly aggravated thereby.

Acute catarrhal manifestations in the stomach and in

the intestinal tract are not uncommon, becoming severe and only managed with great care and difficulty. Mucus **diarrhea** and **vomiting** may be severe, accompanied with severe erratic pain. **Jaundice** is present from the same cause. **Inanition** may follow from suspended or imperfect functional action of these organs. This becomes serious, as nervous exhaustion is also induced.

The nervous system is quickly influenced by influenza. It is estimated that 45 per cent of all the cases affect the nervous system, and immediate nervous prostration is common. Mental disorder occurs in many cases, especially of those past middle life. Neuritis, neuralgias and painful conditions of certain nerves or nerve groups are common. Paralyzes and locomotor ataxia may be induced. The heart is directly influenced. There may be inflammation in any of its several forms, resulting in dilatation and consequent valvular lesions, or through impairment of the nervous centers there may be tachycardia or bradycardia, or other erratic action of an obscure character. Feeble heart action is common, and this must receive persistent attention from the first.

Kidney complications, as renal congestion, with albuminuria, acute nephritis and pyelo-nephritis frequently occur, and cystitis is not an uncommon complication.

Diagnosis:—Acute coryza is very commonly declared to be la grippe. A distinction must always be made between these cases and those typical in character, as the latter demand more care and widely different treatment. The presence of an epidemic will usually determine in favor of the malady, but endemic cases must not be overlooked. The sudden attack, the extreme headache and nasal symptoms, the violent backache and muscular pains, with sudden and rapidly increasing weakness, and finally the abrupt termination and quick restoration are all pathognomonic of influenza.

Treatment:—A common error of the laity to which the profession gives too little attention is the belief that one

must not give up to this disease, but must continue about his employment actively and must fight it off by physical exercise. This is productive, in many cases, of the most dire results. It is the author's observation of many hundreds of cases that those who have the disease mildly—with a quick termination—those who recover with the least exhaustion, those who avoid complications and sequelæ are those who, at once, recognizing the possible seriousness of this malady, give themselves up entirely to the treatment and cure of the disorder by the most approved and active measures, anticipating and antagonizing every indication most promptly.

The patient should immediately go to bed and remain in bed until all active symptoms have abated. He should at the very onset take a hot mustard foot bath or a Turkish bath and induce free perspiration. Hot teas with a full dose of *asclepias* or *jaborandi* will be of great service. He should cover up warmly in bed and continue a mild transpiration for some hours. While I am opposed to the use of the synthetics in general, in sthenic cases at the first appearance and recognition of the characteristic headache a dose of from five to eight grains of *acetanilid*, repeated perhaps once, will be of great service. The other indicated remedies must not be neglected for this. Another remedy which has been specific in many cases with me for the orbital or supra orbital pain with that characteristic distressing feeling of fulness, tightness and engorgement across the face at the root of the nose is *sodium salicylate*. To an adult I at once prescribe three fifteen-grain doses two hours apart. This produces a marked amelioration of the symptoms and facilitates the influence of other directly indicated remedies. In doses of perhaps five grains every two or three hours, the remedy may be continued if the severe muscular pain, soreness and aching persist. *Gelsemium* is a remedy of much service for the phenomena of engorgement above described if given in full physiological doses. From three to five minims of the specific medicine

every hour is essential with which to control the high temperature. It reduces the irritation, both of the nerve centers and of the peripheries, and permits a relaxation—a dilatation of the capillaries—and thus at once abates the engorgement and equalizes the circulation. Another remedy for the above phenomena in many cases is **salicin** in from five to ten grain doses every two or three hours during the first day, and perhaps every four hours the second day. Its influence is general and its tonic properties prevent depression. It also relieves the severe muscular aching. For the fever **aconite** should be given in small frequently repeated doses, continued with either of the above remedies. The indications for **bryonia** are conspicuous in many cases. **Macrotys** is indicated for the muscular aching that persists after the abatement of the immediately severe symptoms. When the fever continues **aconite** and **macrotys** should be given together in small doses every hour. The complications which arise must be met promptly by the administration of the remedy that the specific indications will suggest.

Cactus is indicated for the depressed heart. **Phytolacca** will meet the glandular complications, which are often so stubborn and intractable. **Echinacea** has a wide and general influence and may be given when the patient continues very ill, with symptoms of infection of any character, or where typhoid symptoms appear. **Ammonium chlorid** is of great value where bronchial irritation, with deficient secretion, persists. From two to five grains may be given every two hours. The indications for **euphrasia** are those of acute coryza, persistent in many of the cases. This will be especially efficient in la grippe of infancy and early childhood. When this condition persists with bronchial irritation the air of the room must be kept moist. A vapor impregnated with the oil of eucalyptus, or this oil and turpentine, equal parts, is of great value. The **monobromate of camphor** in certain forms of nervous irritation is also of service in this disease. When the symptoms abate, the

temperature falling and the skin and tongue moist, **quinin** should be given, two grains every three hours, on the second or third day of convalescence. **Hydrastin** may be combined with it, and **nux vomica** if feebleness is pronounced, and especially if atonicity of the stomach and anorexia persist. The **strychnin arsenate**, $1/67$ of a grain every three hours, will be found an excellent tonic and restorative when convalescence is delayed or prolonged.

The patient must be kept in the house and in an equable temperature, with no physical exercise or exertion, until convalescence is thoroughly established. This is as imperative as the necessity for putting the patient in bed at the onset. The temperature, at first high, becomes subnormal in most cases in early convalescence, and exposure at this time would result only in relapse.

TUBERCULOSIS.

Definition:—A condition of general systemic or local infection from the presence of a specific micro-organism, the **bacillus tuberculosis**, characterized by the development at the point or points of lodgment of the bacilli, of gray or grayish white, pearl-like or perhaps yellowish nodular bodies, or tubercles—elementary masses. These, aggregating, form larger tubercular masses, which in turn pass through the processes of caseation, sclerosis, ulceration and tissue necrosis, or in an occasional case, they become calcified.

Etiology:—The true and unquestioned cause of this disease, the **bacillus tuberculosis**, was discovered by Koch in 1881. This at once established the fact that the inflammatory processes were not the cause of the formation of tubercles, but that these processes were the result of tuberculous development.

There are many predisposing causes, but the fact that there must be **constitutional weakness**—a condition of the system, or of the tissues favorable to the growth and development of the germ—must not be forgotten. A favorable constitutional condition may result from the presence of an hereditary weakness, or dyscrasia, or vital impairment, or it may be entirely the result of environment. **Nationality** has a strong predisposing influence. The negroes and the American Indians in our own country, and any crosses between them and the white race, are very susceptible to the development of the disease. Some other races are also quite subject to it. With Irish immigrants in the United States the mortality is next to that of the colored races. In the north and in the mountainous regions—in high altitudes—there is a degree of exemption from its ravages. Where there is prolonged moisture and cloudy weather, with abrupt temperature changes, in low altitudes, it is more prevalent. It is more common also in crowded portions of large cities. Children born in unsanitary surroundings, of parents who are habitually dissipated or who suffer from syphilis or other constitutional dyscrasia, especially those who have had tuberculosis, are liable to its infection.

The theory that the disease is hereditarily transmitted, as generally considered, is now discarded, but the constitutional weaknesses induced by the disease—a lack of resisting power—is certainly entailed, and children so encumbered are especially liable to tuberculosis. There may be **hereditary transmissions**, from the mother to the child, in utero, by direct infection. The disease may at once appear in the child, or after a varying period of incubation, it may appear in childhood or in early adult life, take on active development, either locally or in a constitutional form, and result fatally.

Those conditions which are named as inducing pneumokoniosis—the inhalation of different forms of dust—will predispose the respiratory passages to direct infection, or

will induce conditions which, lowering the vitality, will permit the invasion of the disease.

The germs are usually introduced through the inhalation of dried impalpable dust, which carries them into the respiratory passages. It is argued that the exhalations of tubercular patients are not likely to carry the infection, as these are moist and in masses, although Flugge argued strongly that the germ is carried in very minute droplets, or minutely subdivided particles of sputum and saliva directly by coughing from the infected patient to the individual. The exhalations expectorated and dried, finally become pulverized and then float in the atmosphere. Unlike acute contagious diseases it is not conveyed by a single exposure, but the prolonged immediate association with the patient is necessary to induce infection. The walls of the house or room in which the patient lives, with its contents, will in time become infected with the germs, which may persist for months in spite of energetic measures to destroy them, and one continually occupying the room, subsequently will be liable to infection.

The ingestion of food which contains the tubercle bacilli is the cause of the disease. The milk from tuberculous cows or the meat of diseased animals is a direct cause of infection. Koch in 1901 discarded the idea that tuberculosis in domestic animals and that of man were identical, and claimed that man was not susceptible to infection from cows. This statement was not accepted at the time, and observations made since have served to disprove it. The belief now is that while the germ in animals differs somewhat from that in man, the results of its influence in man are the same with both.

Tuberculosis will follow immediately as the sequel of certain acute infectious diseases. It is not uncommon after a protracted case of influenza, pneumonia, whooping cough, cirrhosis of the lungs or other severe lung disease or after typhoid fever or the exanthematous diseases, especially

measles. It is an accompaniment of the later stages of diabetes.

In **childhood** this disease manifests itself more frequently in a local form. In early life, however, there may be pulmonary manifestations, but these are not apt to occur before the age of eighteen years. From that time until thirty the pulmonary form is much more common than at any other age. It seldom develops after middle life, and if it should occur in childhood its course is very rapid. Intestinal tuberculosis, tuberculosis of the bones, of the skin, of the lymphatic glands, and of the meninges are more common in childhood.

Tuberculosis occurs with but little more frequency in females than in males. Young married women who have the essential conditions for the development of the disease will find that it develops during the first pregnancy. It may not persist, however, but may be apparently controlled. It is liable to remain latent until a subsequent pregnancy, when it will show rapid development and may prove fatal in a short time after confinement.

ACUTE MILIARY TUBERCULOSIS.

Synonyms:—Acute tuberculosis; acute phthisis; galloping consumption.

Definition:—A condition in which there is general infection of the whole body by the bacillus tuberculosis, resulting in the development of tubercles in a number of organs, or throughout the tissues of the body—a scattered tubercular development. However, with the acute phenomena the development of tubercles may be centralized in some conspicuous organ, as in the meninges of the brain, or of the brain and spinal cord, or in the lungs.

Etiology:—It is difficult to assign a cause to the acute manifestation of this disorder. The germs of the disease, from some ulcerating foci, may be thrown directly into the blood stream, where they develop rapidly and from whence the general deposit takes place. The condition occurs more

frequently in youth and early adult life, and usually there has been a local tuberculosis, most often of the lymphatic glands, existing for some time.

The concurrence of acute infectious diseases with local tuberculosis is apt to precipitate an acute form of the disease. In some cases the tuberculous material is discharged by ulceration into the thoracic duct, passing thus directly into the blood current.

Symptomatology:—When there is general infection, which is usually designated as the typhoid form of the disease, it is observed that there is a sudden decline in the patient's health. He complains of general indisposition for a number of days, there is chilliness, extreme languor, headache, with some vertigo, and fever. It will be found that the temperature has been running perhaps for two or three days at from 100° to 103° F. One peculiarity of this fever is that it is very irregular in character; if there are remissions, they are as apt to occur in the evening as in the morning.

A feature somewhat similar to malaria is that when the temperature is high, sweating may occur, rather abruptly, with or followed by a sudden decline in the temperature, which may become sub-normal. The sweating is apt to be very profuse, and the pulse, feeble from the first, is always rapid; the pulse rate does not sustain its usual relationship to the temperature, but varies greatly.

Symptoms similar to those of typhoid fever appear quite early, the tongue becomes dry, there is a deficiency of all secretions, the mucous membranes are red, the tongue is thin, pointed and coated with a brown coat which becomes rapidly darker. The patient is dull, inclined to stupor and there may be more or less delirium. The bright red flush on the cheek, peculiar to hectic, is usually present. The respirations are rapid and a peculiar pallor overspreads the countenance, although in some cases cyanosis develops early. Prostration, emaciation and anemia follow in a short time.

So similar are the manifestations of this disease to those of typhoid fever that it is often with great difficulty that a differential diagnosis is made. The absence of the red spots, the absence of the Widal reaction are in part confirmatory, but it is only when the bacilli are found that the diagnosis is assured. Enlargement of the spleen, tympanites and acute and persistent diarrhea, with hemorrhage, may be present in either case. Herpes labialis is apt to be present in tuberculosis, and in persistent malarial fever, but is not present in typhoid with no malarial complications. Epistaxis, common in typhoid, is unusual in tuberculosis.

The septic cachexia, the rapid and prolonged prostration, the suddenly increasing or erratic temperature, the abrupt occurrence of extreme sweating are all unusual in typhoid.

When the **pulmonary type** of this disorder develops, as it does, more frequently in children than in adults, and often as a result of the infectious diseases of children, the symptoms are similar to those of acute bronchitis. The patient is feeble from the first, the debility is rapidly progressive, and with adults there is great anxiety. There may be chilliness and fever from the first observance of the debility, or these may be delayed for a few days, when with the chill the temperature rises abruptly. There is dyspnœa, cyanosis and severe irritating and persistent cough.

The respirations are very rapid, but the expectoration is not usually characteristic or severe, although it may be rusty colored, as in pneumonia, and there may be hemoptysis. The pulse is feeble, easily compressible and rapid, often irregular. In the later stages these symptoms are aggravated and the breathing becomes very difficult. Upon physical examination there are friction sounds and broncho-vesicular murmurs, with increased dulness. The signs are not dissimilar to those found in a severe case of bronchitis.

Diagnosis:—In the diagnosis of the pulmonic form the

fact of tubercular conditions having previously existed is probably the strongest factor. The disproportion between the area of involvement and the cyanosis and dyspnœa is another factor. There is apt to be present other local manifestations of the infection which assist in the diagnosis. A compensatory emphysema may produce exaggerated resonance when dulness was anticipated.

ACUTE PNEUMONIC PHTHISIS.

In some particulars the pneumonic development of miliary tuberculosis, and the acute development of pulmonary tuberculosis, which is known as acute phthisis or galloping consumption, closely resemble each other, and yet a sharp distinction must be made between them. In the latter disease the infection is strictly local and the process of the tubercular development results in the rapid destruction of lung tissue, but is accompanied with pathological changes, which closely resemble either acute lobar pneumonia, or, as is common among children, it may show the characteristics of bronchopneumonia. Usually the condition occurs secondarily to an infection elsewhere, although in a very few cases it has occurred as a primary disorder. The preliminary phenomena of malaise, chill, fever, cough, more or less severe acute pain in the diseased area, and early night sweats, are characteristic phenomena. Hemorrhage is more common perhaps in this than in the chronic form. Whether slight or severe, there is much prostration and rapid emaciation.

The evidences obtained from a physical examination so closely resemble a typical case of pneumonia that it is with great difficulty that a distinction can be made. There is dulness on percussion, with evidences of hepatization and ultimate complete consolidation. There are bronchial breathing and crepitant rales, which are at first fine, but subsequently become loud and moist. These later give way to evidences of softening where a cavity ultimately appears. The respirations are rapid and shallow at first,

and cyanosis ultimately develops. The expectoration may consist of a thick, colorless mucus at the onset, to be quickly streaked with blood later, or to present the characteristic rusty colored appearance of that of pneumonia, which has given the disease the name of tuberculous pneumonia. A fact used in the differential diagnosis of the two diseases is that actual free hemorrhage seldom occurs in pneumonia.

At first, after the appearance of marked pulmonary symptoms even, the patient may continue in an indifferent manner about his daily occupation. But the prostration is so rapid that he is obliged to yield entirely to the disease, which usually proves fatal in the course of six weeks. However, there is a type that is designated as sub-acute, in which the progress of the disease is less rapid, and the fatal termination may be delayed five or six months.

Treatment:—No specific measures can be suggested which are successful in acute phthisis. Those general measures which are adopted in the chronic form of the disease are applicable, except change of climate. So rapid is the progress of the disease that it is seldom that anything is accomplished by a change, and the worry, fatigue and exhaustion consequent upon making a change only advance the progress of the disease.

While this condition may run its entire course and terminate fatally in about the same time as that of a severe case of pneumonia, or a prolonged case of typhoid pneumonia, it usually lasts from two to three months, somewhat longer than that of the general miliary type of the disease. The course of the disease is very rapid in childhood.

PULMONARY TUBERCULOSIS.

Synonyms:—Pulmonary phthisis; chronic tuberculosis; chronic pulmonary tuberculosis; chronic ulcerative phthisis.

Definition:—Tuberculous development within the structure of the lungs, characterized by hectic fever, cough, progressive emaciation, night sweats, diarrhea and great prostration.

This disease is probably more widely prevalent than any single disorder. It has developed with advancing civilization and chooses all alike, without distinction of social standing, race or color, except as has been stated. It is more common between the ages of eighteen and thirty, and, during middle life, although children, especially after six years of age, are not wholly exempt. Those of advanced age quite readily contract the disease also.

Symptomatology:—In a large proportion of cases the development of this disease extends over quite a period of time. There is a history of impaired health, from causes that seem to be well understood, but the treatment of which has been unsatisfactory.

In other cases there is a history of exposure, with an acute inflammation, most commonly some one of the forms of acute lung involvement, which during a protracted and unsatisfactory convalescence develops a hectic fever, night sweats, greatly increased prostration, emaciation and a return of cough, though perhaps it differs in character from that which previously existed. The cough of severe bronchitis may continue in spite of all treatment, until hectic fever, chills and night sweats appear, and lead to a diagnosis of developing phthisis.

It is observed in the cases of slower development that there is increasing debility, an incapacity for continued labor, or for any persistent active exercise, and an inclination to be chilly on slight exposure or from a draft. There may at first be no cough, but in the larger proportion of cases a persistent cough is present, which varies in character at different times, but is always unyielding to any of the usual methods of treatment. Occasionally there is much improvement at the first, but the condition suddenly increases without known cause and becomes very severe, and the sputum may be streaked with blood, or there may be a slight hemorrhage. This always causes alarm and usually results in a thorough investigation, disclosing the real character of the disease.

With the occurrence of the chilliness, if the temperature be taken, it will be found that there is a slight elevation above the normal all the time, perhaps less than a degree, or even a fraction of a degree, at the lowest point, increasing, with an increase of chilliness, at a given time each day, usually in the evening, to perhaps $101\frac{1}{2}^{\circ}$ F. If the cough is not conspicuous, this is ascribed at once to chronic malaria, and treatment for this condition is instituted, which postpones the discovery of the real cause until the disease may have become thoroughly established. Persistent fever, progressive emaciation and increasing feebleness, with developing cough, ultimately prove an error in the diagnosis and lead to the discovery of tuberculosis.

The fever is seldom persistently high; in fact, 103.5° F. is probably the point of its highest development. It varies from 99.5° F. to 101.5° F. in the milder cases, or in the incipient stage, to from 101.5° F. to 103° F. in the severe cases, or in the stage of complete development. In the later stages of this disease there may be septic or pyemic infection, which will increase the temperature and alter somewhat its previous character. At other times, in the erratic temperature changes, it may become sub-normal for a short time, as low as 96° F. in some cases, for brief periods. The chilliness is more apparent in the developing stage. When the disease has reached its full development and a higher temperature persists, the chilliness disappears, or only occurs on actual exposure. The fever is always more or less irregular in character and may be temporarily influenced by antipyretic remedies, but ultimately increases and persists in spite of the treatment.

The pulse is rapid from the first. It is disproportionately so as compared with the temperature. This is due in part to the profound impression the presence of this disease makes upon the vital centers. The pulse varies, but is always small and easily compressible, and as the disease progresses, becomes feeble, sometimes hard and wiry, at other times slightly irregular.

The tongue varies in appearance in this, as in all febrile diseases, as the conditions within the system vary. At first, while the color and shape may be unchanged, it will be coated white or brown, as in the condition described as "biliousness." This confirms the early erroneous diagnosis of malaria. Later, local irritation and a deficiency of normal acids within the system deepens the color of the membranes. The tongue becomes thin and more pointed and dark red, and a dark fur is persistent. Stomatitis is a common complication; an aphthous ulceration, difficult to relieve, or thrush, or other form of ulceration, may appear.

The cough varies greatly in the time of its appearing, and in its character. It is, of course, the result of the progressive changes. At first, if nervous irritation, or bronchial irritation, with deficient secretion, are present, it will be dry and irritating, perhaps hoarse and barking and almost constant. It is apt to be worse on lying down at night, or on the least exposure to cold. If bronchitis coexists, a distinct thick mucus, or muco-purulent bronchial secretion, will appear shortly, which will materially change the character of the cough. It will occur in paroxysms and will be loose, with a "rattling" respiration. When, in the progress of the disease, softening and disintegration occur in the process of the formation of cavities, the cough is protracted and very "hard" on attempting to rise in the morning, and continues until large quantities of sputum of varying character is expectorated from the tubes and from the cavities, in which it has accumulated during the night. This may induce nausea and vomiting, and result in temporary faintness or exhaustion. The taking of food may induce a paroxysm of cough, which may also result in vomiting. When the cough induces hemorrhage, active efforts for its restraint must be adopted, and it must be controlled also when it induces irritation, sleeplessness and exhaustion.

As has been stated, there may be no expectoration at the onset. This may account for the absence of cough in a few cases, as the cough may be only necessary to clear the air

passages. The first sputum is usually composed of mucus alone, and, unless there is a coexisting bronchitis, it will be colorless, in which case it will assume the greenish or yellowish green, thick and tenacious character of the bronchial exudate. Very soon, however, it becomes grayish yellow in character, somewhat watery in appearance, and is distinctly muco-purulent. As the cavities develop and disintegration of tissue progresses, the sputum is thin and filled with very small greenish gray or yellowish gray masses.

Later, pus will be found in the expectoration, and in some cases, from decomposition within the cavities, the sputum is of a sweetish and offensive taste, and fetid and offensive odor.

If, in the development of a cavity, **hemorrhage** occurs, the blood will not be uniformly intermingled in the sputum, as is the case in pneumonia, but it is thrown out independently. The quantity of the sputum expectorated, during the earlier stages of the disease, increases slowly until the formation of cavities begins, when it increases greatly for a short time, and from that time on will be irregular in quantity, depending upon the course of the breaking down of tissue within the cavity. In some cases only a few drams will be expectorated in twenty-four hours. In the later stages it may amount to from eight to twelve ounces. In childhood and in the aged there may be but little expectoration throughout the entire course of the disease.

Pain:—It is not common for a tubercular patient to suffer pain unless there are rheumatic or neuralgic complications, or unless the pleura is involved. When this appears, the pain occurs on inspiration and is increased by deep breathing and by coughing. In an occasional case there may be a steady pain through the diseased area. Usually it is lateral, or at the base of the lung, or beneath or between the scapulæ. These patients are quite subject to muscular rheumatism of the chest walls, or to intercostal neuralgia.

Respiration:—There is increased frequency of respiration with the onset of this disease, and as the disease progresses, the respirations vary from twenty-four to thirty-six, and the latter point usually continues during the latter stages of the disease. When the tubercular deposits are miliary in character and thus are more general in their involvement of the lung tissues, the respirations become still more frequent, and in the later stages of the disease cyanosis may develop. **Dyspnoea** is by no means as common as in acute pulmonary troubles. It occurs in the later stages when the respiratory area has been seriously reduced in quantity.

Hemorrhage occurs in a majority of the cases of phthisis, especially in those that are ulcerative in type. It is much more frequent in males than in females. In the majority of cases it occurs at first as a single streak of blood in the sputum, or a tiny red clot, later a small mass of frothy blood will be brought up, bright red in color, to be followed soon by other streaks or small clots. While in a few cases the increase in quantity may be very gradual, there is apt to be soon after the first appearance, quite a free hemorrhage. These continue irregular in quantity and at very irregular intervals throughout the entire course of the disease. As has been stated, in an exceptional case quite a free hemorrhage may occur before the disease has been recognized, and sometimes this may be very severe and prostrating. With all hemorrhages, especially those occurring early, there is a flush of heat over the body, some vertigo or faintness, a sweet or sweetish salty taste in the mouth, and increased rapid breathing, with sudden weakness, which in the severe cases amounts to extreme prostration or even collapse. The blood is set free usually during the development of a cavity, but in the first stages it may occur solely from the intense local congestion. It results from ulceration into the small vessels at first and later into the larger ones. In rare cases the tendency may be

increased by a defibrinated condition of the blood—a tendency to hemophilia.

In a very few cases the hemorrhage may occur in large quantity and result in death, either from its immediate influence upon the heart and circulation, or from suffocation. It may escape into the tissues of the lungs, may fill a cavity and induce compression, or it may induce compression and pulmonary apoplexy by escaping in large quantity into the pleural sac. Another peculiar manifestation of hemorrhage is that it may occur in an occasional patient, a number of months or perhaps a year or two, before the occurrence of any symptoms or conditions that will make a diagnosis of tuberculosis possible.

Sweating:—A symptom that occurs early in the disease is sweating. This occurs with the development of the fever, and is commonly nocturnal or occurs only during sleep. From the first it is apt to be very profuse in quantity, and later is the immediate cause of weakness, which is very apparent to the patient. The sweats are caused by the conditions that induce the fever—an effort on the part of the system to rid itself of the toxic elements—and occur when the system is in a state of relaxation. When they produce exhaustion they must be controlled, in order that the strength may be preserved, although the treatment is known to be only temporary in its influence.

Anemia:—Anemia may be apparent quite early, and is attributed to pre-existing causes before pulmonary tuberculosis is diagnosed. It undoubtedly results from the vital shock to the system, impaired oxygenation of the blood and malnutrition. It occurs coincidentally with loss of appetite, faulty digestion, increasing feebleness and emaciation. With deficient red blood corpuscles there develops later in the disease, occasionally, some leucocytosis.

Emaciation:—Loss of flesh and consequently of weight occurs from the onset of this disease, in part from the same causes which I have just named, as those which induce anemia. The patient loses strength because the irritating

causes which are present in the disease, such as fever, sleeplessness, loss of appetite and persistent cough, with occasional hemorrhage, all interfere with nutrition and restoration. These contribute equally in the reduction of the weight of the patient. When the disease is established the loss of weight may early be quite rapid, amounting to an average of from eight to twelve ounces per day.

The rapidity of the loss depends somewhat upon the severity of the disease, and if the pathologic processes are arrested there is a stay in the emaciation, and if a gain in flesh can be secured, this is indeed encouraging.

Gastrointestinal Complications:—The importance of nutrition in pulmonary tuberculosis makes it absolutely essential that the closest attention be given to the digestion and appropriation of food, and for that purpose the condition of the stomach, intestinal tract and the larger glandular organs must be closely watched. Loss of appetite occurs very early, and indigestion appears simultaneously. A chronic gastritis may have existed for some time previously, with the train of symptoms that usually accompany this disorder. At first there is apt to be an excess of hydrochloric acid, but, as is common with other protracted fevers, the acids diminish as the fever progresses, until there may be an absence of hydrochloric acid. **Thirst** is an ever present and often annoying symptom, and the ingestion of large quantities of water may interfere with the already imperfect action of the digestive fluids. All this contributes very materially to defective nutrition and consequent emaciation and debility, but a more important cause of debility is the **diarrhea** which is apt to develop at an early stage of the disease and persist throughout its entire course, although constipation, obstinate and intractable, is observed in an occasional case.

Cystic Irritation:—A mild form of catarrhal cystitis, albuminuria or actual nephritis are conditions that occur in a few cases when this disease has become fully developed.

Notwithstanding the fact that nervous complications are

very common in other infectious or pulmonary disorders they are not likely to occur in this disease. Mental depression or **despondency** is almost an unknown factor; the patient is cheerful and happy, always hopeful and optimistic concerning the outlook and lays plans for the immediate future within a few days of death. It is rare that the infection is conveyed to the meninges or to other nerve structures which will develop **meningitis** or **paralyses**. **Peripheral neuritis** is a rare complication, and **insanity** has developed during the progress of the disease, but it is more than possible that a previous tendency to insanity existed, which might have induced that condition if tuberculosis had not occurred.

Treatment of Pulmonary Tuberculosis:—In the treatment of pulmonary tuberculosis a strictly systematic course must be adopted with reference to the following facts, the necessity for which course is now being established by incontrovertible proofs from the united observations of the entire profession:

1. An immediate recognition of the real character of the disease and the prompt adoption of a systematic course and plan of life, for its cure, are of the first and of vital importance.

2. The bacillus tuberculosis must be destroyed.

3. The vital forces of the patient must be sustained and improved by—

- (a) A care-free, out-of-door life, with a correct climatic adjustment and physical exercise, fitted to each individual patient.

- (b) The utmost care of the stomach and intestinal apparatus, to secure the ingestion, the digestion, the appropriation and assimilation of the largest possible quantity of highly nutritious foods. A careful watchfulness through the entire course of the disease for this purpose, until health is unquestionably established.

- (c) Attention to the nervous system to retain its vigor

and prevent the continuance of any irritation of any character.

4. Drugs alone will not cure the disease and must not be depended upon for that purpose, but conditions are constantly arising which materially decrease the resisting power of the patient, reduce his vital force and permit and encourage the development and progress of the disease, which can be overcome entirely, or greatly modified, by medicines, which must then be carefully prescribed.

A proper restraint upon all the developing processes of the disease will exercise a controlling, an inhibiting power upon the influence of the bacillus and will retard its destructive operations. This can be accomplished with medicine. With prompt attention to these conditions tuberculosis in its early stages is certainly curable. Statistics now prove that at least 75 per cent of the incipient cases should recover.

Pure Air and Sunlight:—The first essential in the destruction of the bacillus tuberculosis is an abundance of pure air. The attainment of this alone has resulted in the improvement of the case otherwise unfavorably situated. The patient should spend as much as possible of the twenty-four hours in the open air. Those who have discovered the onset of the disease before their physical strength was materially abated and have wandered off into the woods and have roughed it, **sleeping in the open air** at all reasonable temperatures, and especially in pine woods, have observed a rapid improvement. Others have adopted a cowboy's life, doing at first only such work as the strength would permit, but sleeping always in the open air, riding on horseback and increasing the amount of enjoyable labor as strength improved.

Amelioration of the symptoms is effected at home, by the patient spending the days in the **sunlight**, and the nights in a large open room, freely ventilated, or upon a veranda, or on the house top, as is done in large cities in an occasional case.

At all resorts for such patients provision is now made for exposed sleeping rooms and for sunbaths in the open air. Much has been said of the benefit of cool air, to properly protected patients, but the consensus of opinion now is that temperature is of less importance than pure air and sunshine. A temperature which is steady and uniform, devoid of sudden changes or of contrasts between the night and day temperatures is most desirable. Provision is now made for the construction of small portable houses where a patient can have all essential conveniences, with light and constant, perfect, thorough ventilation by day and night, provision also being made for heating and the preservation of a pleasant and equable temperature when desired.

Dryness and Humidity of the Atmosphere and Altitude:—In patients where the secretion is persistently deficient a **moist atmosphere**, at a comparatively low altitude, and in a warm climate, is desirable. With these the Florida east coast, the gulf coast, and Southern California are desirable locations. The extremes of these climatic conditions are modified at Lookout Mountain, in Southern Georgia, and in North Carolina.

When there is an abundant secretion in the early stage of this disease, a **dry climate** is to be preferred, and usually higher altitude. New Mexico and Arizona offer exceptional advantages in this particular, as there any elevation that is desired may be obtained, from three thousand to twelve thousand feet or more. Changes of temperature can be thus obtained if it becomes too hot in the lower altitudes, or too cold in the higher. The dryness of this climate is persistent and the sunshine is unfailing. The mountain atmosphere is very invigorating.

In those cases in which **bronchial irritation**, or irritation of the larynx, is a conspicuous feature of the disease, it is usually best to avoid a hot and dry climate, but as these conditions are accompanied with deficient secretion, this fact has been considered in the reference made to the coast.

Throughout the entire range of the mountains in our extreme west are desirable locations for consumptives, as well also as on the east coast, especially in the Adirondacks. A factor that must be estimated upon in determining **altitude** is the condition of the **heart**. Where the heart muscle shows signs of enfeeblement at the start, and where the pulse is persistently rapid, a high altitude must be avoided, as these conditions are increased, as are also certain valvular disorders. **Emphysema** is increased and the respiration becomes more difficult in high altitudes, which are also undesirable with patients who have previously suffered from **neurasthenia**, accompanied with persistent nerve irritation, which has influenced the functional operations of other vital organs. Patients with whom hemorrhage has appeared early do not usually do as well at first in high altitudes. These may improve, although perhaps slowly, in a lower altitude, until the **hemorrhage** is controlled, when they may be taken to a gradually increasing altitude, sometimes with much benefit.

Nutrition:—There is hardly a condition of the system that is of greater importance than the preservation of normal gastric and intestinal action, that the food shall be received pleurably, quickly appropriated and readily assimilated. With the development of a reasonably high temperature, often quite early in the history of the disease, the secretions become deficient throughout the body, and especially those of the gastro-intestinal tract. Among these a deficiency of the normal acids is conspicuous. The evidence of this is red mucous membranes, red, thin-pointed tongue, often with elongated papillæ. Another condition is that in which the tongue is of normal size and thickness, but moist. The papillæ, however, are elongated and very red, except upon the tip, which is coated white. I have observed this peculiarity in several cases of achlorhydria.

This condition demands acids, and explains the fact referred to later on, that hydrochloric acid and the tincture of the chloride of iron are acceptable in so large a propor-

tion of these cases. Chronic gastritis in some one of its many forms is very apt to be present with its well-known manifestations. A poor appetite, which is difficult of improvement, is also common. These conditions will receive attention under medical treatment.

In adapting the food to the patient, while the highest nutrition must be preserved, the individual articles must be selected with reference to existing conditions and idiosyncrasies. Because of the rapid progress of the emaciation and because of the demand for nutrition in the reconstructive and restorative processes, the feeding must be generous in the extreme.

The French method of feeding comprehends the introduction of concentrated liquid nourishment into the stomach through a tube, at regular intervals, without regard to the desires of the patient, the appetite or the condition of the stomach, or of the nervous system. This must prove irritating and unacceptable in a large number of cases, as, leaving other conditions out of the consideration, there must be nerve force and power behind the digestive processes, and if these are absent no appropriation can be made of the excess of food.

Exercise and out-of-door air increase nerve force and promote an appetite. These can also be further increased with medicines properly adjusted. The appetite must be satisfied with fresh raw eggs, given in a fixed quantity at stated intervals; milk similarly given, meat juices and rare meat, as raw beef properly prepared and seasoned. These may be made very palatable, and should be given about five times a day at stated intervals. It is well for the patient upon awakening in the morning, before being disturbed, to drink slowly a pint of hot milk, to which has been added a pinch of salt. He should compose himself upon his right side, to sleep again if possible, or to remain perfectly quiet and undisturbed for perhaps half an hour, when this will, in most part, have passed through the pylorus and have

been absorbed without actual digestion. He may take a raw egg with this.

In the course of about two hours he should have a cereal breakfast with cream, and perhaps a small juicy steak, and toast, with oranges or other fruit. At mid-day the patient should have a full strong meal, with roast meat, vegetables or macaroni, a dessert of rice, tapioca, corn starch or Indian pudding. It is often of much advantage to give a simple digestive after each meal, however small, for a time until the exact digestive power of the stomach can be determined. This may be the essence of pepsin, papaw, some diastatic ferment or pancreatin, as shall be indicated. Soups, oysters and fish are all of value and acceptable under proper circumstances.

It is necessary to give the patient a light meal again late in the afternoon, and at supper-time strong food, but that easy of digestion, must be selected. Oysters, raw or stewed, raw eggs, or eggs soft boiled, should be taken at this meal, with creamed toast and perhaps baked potatoes or baked apples.

In the selection of a **beverage** the patient may be permitted to drink sparingly of either tea, coffee or cocoa, properly prepared. It is well to heat cream or milk, a half tea-cup full, and then fill the cup with the other beverage and season as is desired. If possible, milk should be adjusted as the most reliable restorative beverage. Buttermilk or matzoon and kumyss all are palatable and nutritious beverages and will be accepted when the acids in the system are deficient and when the stomach is feeble.

The use of fruit juices, or jellies dissolved in water, or cider, are all in place under proper circumstances. The author is not in favor of alcoholic beverages in this disease, believing that but little, if any, good has come from them. He has permitted, occasionally, an egg nog made with port or sherry wine, in the advanced stages of the disease.

As has been suggested, the amount of food at each meal

and the character of the food must be adjusted with reference to conditions that then exist and no rule of general and continued application should be laid down, as in no disease do conditions change more readily, or are more easily influenced than in this. In the morning, after having spent a quiet, undisturbed, restful night, a much stronger breakfast can be taken than after broken, disturbed sleep and an unrefreshed awakening. Food in quantity must be avoided immediately after exercise, when the patient is exhausted, or after a fit of anger or worry. A nutritious beverage or a stimulant may be first given and followed by a period of rest, after which food properly selected may be given.

Medical Treatment:—In the adaptation of medicines to this disease it is my custom to begin with a course of tonic treatment, which adds tone to the central nervous system, and to the stomach, without general stimulation.

In quite a large number of cases there is found to be a deficiency of acids in the fluids, as well as a condition of achlorhydria in the digestive fluids.

While **hydrochloric acid**, in from five to fifteen minim doses, may be administered after each meal, it should be given conjointly with **hydrastis**. This remedy is best given in the form of the colorless fluid, or where there is unmistakable chronic gastritis, five-grain doses of powdered **hydrastis** may be given after each meal, with perhaps a fourth of a grain of powdered **capsicum**. I have frequently prepared a capsule which contains one grain of the yellow alkaloid of **hydrastis**—**hydrastin**—one-fourth of a grain of powdered **capsicum**, one-eighth of a grain of the extract of **nux vomica**, one grain of the precipitated **carbonate of iron**. This combination must be often administered to be appreciated. It is certainly of great value in restoring the tone of the stomach and in improving the appetite. Other remedies for this purpose which may be selected are **collinsonia**, **gentian**, **cornus florida**, **columbo**, **glycerine**, **quassia**,

ptelia and *frasera*, which also corrects excessive night sweats and diarrhea.

When these conditions are present with anemia much benefit has been obtained by the use of the tincture of the chlorid of iron in from five to ten minim doses, after meals, instead of hydrochloric acid. There is sufficient free acid in this to assist the digestion, and the conditions are favorable to the appropriation of the iron.

In a large proportion of cases the condition of the nervous system will be restored by those tonics which are adjusted to other existing conditions. However, it is common for all practitioners to administer the **hypophosphites** or the **glycerophosphates**, or when spinal irritation or general nervous irritability exists, with a deficiency of acid, the compound syrup of the phosphates, all with excellent results. *Nux vomica* with me supplies the demand for strychnine, without any irritating influence, but I have found cases where there was persistent oppression of the breathing, with exhaustion, in which the **arsenate of strychnin** in small doses produced good results.

When nervous irritability exists, with or without cerebral hyperemia, which is sometimes present, gelsemium or the bromides may be given for a short time. Gelsemium tranquilizes the nervous system, soothes the heart's action and conduces to refreshing sleep. For this purpose it may be given to good advantage in conjunction with *hyoscyamus*, *passiflora* or *Jamaica dogwood*.

When the condition of the heart demands attention the specific indications should be carefully studied, but usually speaking, there is an atonic condition, with irregularity, which is satisfactorily met with *cactus* or *lycopus*. The latter remedy is especially useful in its influence upon the capillary circulation of the respiratory apparatus, when fever is present, promoting a greater freedom of respiration and more perfect oxidation, while *cactus* improves the nutrition of the heart organ. When dyspnea is present

with these complications, quebracho, whether alone or in conjunction with lycopus, may be given to advantage.

For its constitutional and local antiseptic influence, **creosote** is accepted as a remedy of much efficacy. This agent must be given, however, with reference in each case to its receptivity by the stomach. With some patients it is readily received and improvement is apparent almost from the first. With others the necessity of first adjusting it to the stomach is apparent, as the remedy is poorly received, except perhaps in very small doses. Sometimes it can be begun in small doses and increased to the desired quantity. With other patients no adjustment is possible, and the use of the remedy induces a general disorder of the digestion, unpleasant eructations and dizziness, with perhaps persistent nausea. When the remedy is properly received, without interfering with the functional operation of other important organs, there can be no doubt of its beneficial influence.

For the fever and for the inflammatory processes existing within the lungs, direct remedies have but little influence, and yet beneficial results accrue sufficiently often to encourage their administration. No special sedative must be given in sufficient dosage to produce depression, but minute doses of **aconite**, **bryonia** and **belladonna** may be continued in small doses for a considerable length of time with pronounced benefit in their staying or retarding influence upon the pathologic processes. **Bryonia** is of especial benefit and may be given in conjunction with lycopus when that remedy is indicated, as has been suggested. Together they clear the respiratory passages, unload the air cells, equalize the capillary circulation, produce a freedom of respiration and are soothing to respiratory irritation.

Sponge bathing or general bathing for the fever, in consumption, while of value, must be administered with the utmost care and must be always adjusted to the immediately existing conditions and seldom advised in advance.

The cough is a most troublesome feature of this disease

and one often quite difficult to control. It is often the case that specific cough remedies are contra indicated and that the sleeplessness, exhaustion, annoyance and worry from the cough result in such debility that relief of the cough is imperative. The inhalation of soothing medicinal substances is advised. Where the cough is very dry the **inhalation of steam** alone, or steam charged with **acetic acid**, with a little **turpentine**, or with the tincture of **benzoin**, will be all that is necessary. A hot bath taken before retiring, in a warm room, heavily charged with steam vapor, will sometimes secure a quite restful sleep, with freedom from cough during the entire night. The use of the acetated tincture of lobelia, or of **lobelia** and **sanguinuria**, or of the **stillingia liniment**, a few drops on sugar, or of from two to four drops of turpentine on a lump of sugar, held in the mouth, the patient breathing through the mouth, will sometimes sooth a cough for some hours. Small doses of **codeine** or of **cannabis indica** will be found necessary when the cough is violent. The latter remedy will, in certain cases, relieve the cough most satisfactorily, with marked improvement of the respiration and circulation, and a sense of general well-being. In the later stages of the disease a cough syrup may be prepared after the usual method, which contains small doses of the deodorized **tincture of opium**, **paregoric**, or morphine, but usually these agents are not advised.

Half of an ounce of the **syrup of ipecac**, with three and one-half ounces of the **syrup of wild cherry**, to which is added three drams of **ammonium chlorid** and three drams of the deodorized tincture of opium, is sometimes useful in dram doses every three hours. The old method of treating this disease by the nauseating expectorants has long since been abandoned.

The **pain** is not usually severe, but mild conter irritation is indicated for this, with **bryonia**, when the pleura is involved, or fifteen minim doses of **asclepias**, or very small doses of **morphine**. The author's favorite formula will control both pain, cough and nervous irritation. This is made

of the sulphate of morphin one grain, sodium bromid three drams, tincture of **capsicum** fifteen minims in two ounces of the syrup of tolu or of wild cherry. This may be taken in dram doses every half hour, hour or two hours, as needed, with no unpleasant results.

Hemorrhage, when appearing early, must have prompt and efficient attention at once. It is best controlled with ten-grain doses of **gallic acid**, but **ergot** is effectual also, as is **thuja**, in small doses. The compound tincture of **erigeron** and **cinnamon** is probably the most reliable of all these agents, but it disturbs the stomach to such an extent that it is often contra-indicated. In sudden and severe hemorrhage medicine does but little good, as the hemorrhage is past before the remedy is absorbed. The benefit from medicine is obtained where there are frequent small hemorrhages occurring at irregular intervals, perhaps several times during a week. An astringent should be given in small doses at intervals of perhaps four, six or eight hours, and continued over quite a length of time. The course is not highly satisfactory even then, as the ulcerative processes from which the hemorrhage occurs are probably steadily advancing.

The **sweating**, when mild in character, does not need special attention. When the patient is taking tonics, as **hydrastis**, or the tincture of the chloride of iron, these sometimes keep the sweating in abeyance satisfactorily. When night sweats produce exhaustion they must be checked if possible. A single dose of the one one hundred and twentieth of a grain of **atropin** at bedtime is sometimes all that is needed, and when first administered this is often not needed more than two or three times each week, later each night. Often a drop of the tincture of **belladonna** before meals and at bedtime will exercise a good influence upon cough, pain and mild night sweats, influencing the actual pathological conditions. **Agaricin** is an efficient remedy, a single dose of from one-twelfth to one-eighth of a grain given at bedtime.

Other remedies which may be useful in this condition are **duboisine**, in one one hundred and twentieth of a grain dose at bedtime; **geranium**, **muscarine** and small doses of **pilocarpine**. When other conditions would permit, I have dissolved **quinine** in aromatic sulphuric acid and obtained excellent results from this. Alexander of Berlin advised the use of **camphoric acid** for this purpose. In the treatment of tuberculosis in general he dissolved one part of **camphor** in nine parts of olive oil and used this in perhaps five-drop doses, hypodermically, every three hours. It supported the strength, relieved disagreeable sensations and exercised a controlling influence over the night sweats, cough, expectoration and diarrhea.

In the treatment of the **diarrhea** of this disease attention must be paid to the condition of the stomach and to the diet primarily. Subsequently **geranium**, **epilobium**, **turpentine**, and other mild astringents of this class, may be prescribed as indicated. It is sometimes necessary to give intestinal antiseptics for this purpose and occasionally a colonic flush with the **peroxide of hydrogen**, as suggested for typhoid fever, will be sufficient.

Where the diarrhea is accompanied with **nausea** or **vomiting**, when other conditions are corrected, a powder may be given every two or three hours, which contains ten grains each of the **subnitrate of bismuth** and **ingluvin**. This exercises a double influence, which is usually satisfactory. When the indications show that there is a deficiency of acids, or an excess of acids, these conditions must be corrected by appropriate treatment before the diarrhea can be controlled.

In a few cases the patient will suffer from **painful swallowing**. This will be controlled by some mild pain relieving remedy unless it is neuralgic or spasmodic in character, when it must be treated with **gelsemium** or small doses of **lobelia**.

For the **debility** of consumption, in addition to the adoption of the course or courses that have been suggested, it

is frequently important that **cod liver oil** be administered to the patient. With some individuals an adjustment of this remedy cannot be made; with others it is received with no difficulty; yet, with still others, a little attention to the stomach and digestive processes is all that is necessary for its favorable reception. I am inclined to think that the pancreatic function is interfered with in those cases where the oil is not digested, as it is one of the purest of the fats, and I think the administration of **pancreatin** or other mild artificial digestive that will assist the digestion of fats, will promote its ready and satisfactory absorption.

Prevention of Pulmonary Tuberculosis:—That this disease can be prevented is now universally acknowledged, and laws looking to the enforcement of proper conditions have been passed by several of the states. In the first place, when it is determined that a patient has a predisposition to this disease, or that from other tubercular conditions within the system there is a tubercular diathesis, the patient should be removed to a climate which is of benefit in the treatment of this disease, and must have an abundance of out-of-door employment, or exercise, and the essential food.

When a patient is suffering from the disease and remains in contact with other individuals, he must sleep alone, in a thoroughly ventilated room, and all of the sputum must be expectorated directly into a proper spit cloth, or into soft cloths that have been treated with some antiseptic solution, and these must be burned before the sputum dries. The floor of the patient's room must be devoid of carpets, and the walls of hangings, and everything that can possibly be dispensed with must be removed.

Most important of all is the complete isolation of the patient. There is now no doubt whatever that the prevalence of this disease at the present time is due not to hereditary transmission, as was once thought, but to the fact that the patient has lived with the family in close and poorly

ventilated apartments during the entire progress of the disease.

FIBROID PHTHISIS.

This is a condition of tubercular infection that lacks many of the characteristics of chronic tuberculosis. Clinically considered it is nearly identical with interstitial pneumonia. There is an increased amount of fibroid tissue or of connective tissue elements in the diseased area, which condition may be observed when there is no tubercular development present. There is ultimate contraction of the lung substance, and thus a reduction in the size of the affected lung, which becomes hardened and dense. This disease is insidious and of very slow development. The general health of the patient is not materially impaired at the first, and consequently the disease may be overlooked, until it is firmly established. While cough is present, the expectoration is not characteristic and the respiration is not essentially increased, although the breathing may be embarrassed, especially upon exertion. There is but little emaciation and only a very gradual loss of strength. These conditions appear during middle life and may continue a number of years. In the latter stages paroxysmal coughing is a permanent condition, the spells occurring usually on rising in the morning, with the greatest severity, and in a milder form during the day. A severe paroxysm may occur also during the night. With these there is a purulent expectoration of an offensive sputum, which may be present in large quantities, with difficult breathing and now greatly impaired general health. As the disease has progressed, changes have taken place also in the heart, liver or kidneys, resulting in chronic disease of these organs, which may terminate in dropsy or other characteristic manifestation.

SEROUS TUBERCULOSIS.

Tuberculosis of the serous membranes within the body is an insidious disease, occurring usually secondary to

local tubercular conditions elsewhere in the system. It is commonly believed that the condition occurs as a primary infection, but, if so, such an occurrence is rare. It may occur as an acute sero-fibrinous manifestation, or it may occur as the result of general tubercular infection in the form of an acute miliary serositis. These two conditions may occur coincidentally or separately, or the disease may develop slowly in a strictly chronic form. The latter form occurs usually from infection of the serous membrane from some tuberculous organ adjacent, in which the process of development has been slow.

Tuberculous Pleuritis.

This condition may occur both in an acute and in a chronic form. In the acute form the initial symptoms are in every way similar to those of acute pleurisy, or to an attack of acute lobar pneumonia, in which the pleura is involved.

There is a chill, which may be quite severe, but the temperature does not reach a high point, but will be irregular and perhaps hectic in character. The sharp acute pain occurs among the first indications, and there is painful inspiration, a catching of the breath with rapid breathing, irregular and shallow, and a short hacking, very painful cough. Effusion also occurs early and is serous, serofibrinous or seropurulent in character. The effusion rarely contains the bacillus. This must be taken from the pleural membrane direct.

In the chronic form of this disease, which occurs more frequently than the acute form, the invasion is insidious and may be overlooked until fully developed. It is evident that the visceral layer of the pleura must be immediately involved whenever the periphery of the lung is infected. This results in the occurrence of pain, which will slowly increase, interfering to a corresponding extent with the respiration. This pleuritis may develop from the advancement of the inflammatory processes before the membrane

is invaded with the bacillus. The effusion is similar to that of the acute form, but is apt to be sero-fibrinous and is more likely to be streaked with blood. It is scanty at first, but increases slowly in quantity. The cough and other symptoms of pulmonary disease are attributed to that condition which has pre-existed. When the effusion is absorbed, adhesion occurs, and there is thickening of the pleura of a permanent character. When the pulmonary disease advances toward a fatal issue and the tubercular mass softens and becomes disintegrated perforation of the pleura may occur and a portion of the contents of the cavity may escape into the pleural sac, resulting in greatly increased pain, profound depression and extreme dyspnoea, with all the phenomena of pyo-pneumo-thorax.

Tuberculous Pericarditis.

In tubercular invasion of the pericardium the conditions are similar to those of tubercular pleuritis. It is usually a secondary infection, and presents but few symptoms, and these are so similar to those of non-tubercular pericarditis that they cannot be distinguished. The knowledge of a pre-existing tubercular condition is almost positively confirmatory of the diagnosis, when the disease is fully established. In a few cases there are no clinical evidences by which the disease may be positively diagnosed, and its existence is only determined post mortem. Most frequently there is but little effusion, and adhesion takes place slowly. This leads ultimately to hypertrophy and dilatation with the usual symptoms. Where effusion is present in any quantity the evidences of dilatation are apparent earlier.

Tuberculous Peritonitis.

Invasion of the peritoneum by tubercular bacilli is an exceedingly frequent and important disease. The condition occurs most frequently in females and in adults. In nearly three thousand autopsies performed on patients who had died from tuberculosis more than twenty per cent were

found to have tubercular peritonitis. It occurs as secondary infection in most of the cases, although primary invasion is not impossible. It is necessary that it should be recognized early, as it is a curable condition if so recognized, being more amenable to treatment than any of the other tubercular infections, except perhaps that of the lymphatic glands. It occurs in the development of acute miliary tuberculosis, with the characteristic phenomena, or in the form of a chronic invasion where the nodules are large and firm, and although there is but little exudation, there may be widely diffused adhesions. In still another form, which is designated as the fibroid form, the fibroid degeneration occurs slowly.

In the acute **miliary form** ascites occurs early, the serous effusion is profuse in many cases, and often this dropsical condition is the first manifestation of the disease. In the **second form**, which is sometimes called the **ulcerative type**, the nodules, which contain caseous matter, ulcerate and adhesion occurs, usually with but little effusion. The effusion, however, may be purulent and of considerable quantity, but walled off by adhesions.

In the **fibroid form** adhesion between the intestines and omentum occur slowly, interfering materially with the functional action of the intestinal canal. The abdominal wall is hard and board-like, and the nodular condition of the peritoneum is very perceptible to the feeling. The abdominal muscles can also be readily outlined through the skin. While this condition is not uncommon before puberty, it is much more apt to occur in women between the ages of eighteen and thirty-five years, and occurs more frequently in negroes than in whites. It is thought that the invasion of the peritoneum in females occurs from tuberculous invasion of the fallopian tubes.

Symptomatology:—The acute cases develop with a chill and a temperature which quickly becomes high, perhaps 104° F., and which may remain quite steady, with but little remission for many days. The effusion occurs early and

with it typhoid symptoms, emaciation, prostration, anemia and some delirium may also occur. If the effusion is purulent or sero-purulent in character the fever quickly assumes a hectic type, and the pulse becomes rapid, small and feeble. A distinction must be made between abdominal distention, from ascites and from tympanites. It is not uncommon from intestinal peresis for the intestines to become distended with gas. In another class of cases the development is very insidious. The patient is distinctly out of health, but the local manifestations are not marked, gradually pigmentation occurs and a slight nodular feeling is apparent in cases where the abdominal walls are not too thick. There may be but little effusion, but this, if it persists, as it usually does, induces a slight fever, with anemia, progressive debility, persistent malaise, gradual emaciation and ultimate decline.

Diagnosis:—The diagnosis may be rendered difficult by the absence of any characteristic symptoms. The close resemblance of the acute or sub-acute manifestations to typhoid, results in the real character of the disease being overlooked in some cases. These manifestations, where tuberculosis elsewhere is known to exist, will point directly to infection of the peritoneum.

Treatment:—Apart from the treatment of tuberculosis of the lungs which, in part, applies to all forms, this condition must have special attention. The condition of the blood must be corrected with active alteratives, and the stomach must be treated with reference to obtaining a rapid appropriation of nutrition, with the least possible irritation. The nutritive material must be in a concentrated form, free from extraneous matter and of ready appropriation.

The results of inflammatory action in the peritoneum must be persistently combated with aconite and bryonia. Iron tonics for the anemia, and cod liver oil for the general nutrition of the patient, are important accessory measures.

With the medicinal treatment the **opening of the peritoneum** is important. Any serous or sero-purulent exudate must be evacuated, and any sac containing fluid must be opened and thoroughly drained. Immediate benefit is often observed from this operation in cases where there is ascites, and much good is observed in other cases, but the benefit is not more immediate nor apparent in any other case than in tubercular peritonitis.

INTESTINAL TUBERCULOSIS.

Definition:—A condition of sub-acute or chronic disease of the walls of the intestines, in which there is the characteristic deposit of tubercle, with the constitutional evidences.

The condition may be primary, from taking in the infective material with the food. (The digestive fluids in the stomach seem to protect that organ and render it immune, as it is seldom attacked.) Or it may be secondary to almost any other local tubercular infection. There being an hereditary constitutional weakness, a primary attack of the disease is more apt to occur in children up to the age of twelve years than in adults. With these, sooner or later, the peritoneum becomes involved, and the two conditions are coincident.

The disease occurs most commonly as a secondary infection in adults, following any other local infection, and especially following pulmonary infection from the swallowing of the saliva and sputum. Perhaps fifty-five per cent of the prolonged cases of pulmonary tuberculosis develop intestinal complications.

The bacilli, like the typhoid bacilli, find their first lodgment in Peyer's patches, in the solitary glands, and spread into the other structures, especially the lower part of the ileum, the cecum, the colon and rectum, and occasionally in the appendix, resulting in a diagnosis of chronic appendicitis.

Symptomatology:—In childhood a primary attack occurs after continued ill health, which may be attributed to heredity, or there may be malappropriation of food, with chronic stomach derangement and marasmus, and a general fault of development, or there may be some other underlying devitalizing cause.

One of my typical cases was that of a girl of eleven years, very fair, with light hair, light blue eyes and pale, waxy, transparent skin. The mother had died when the child was four years old, a few weeks after giving birth to another girl, which grew to adult age and enjoyed perfect health. When less than six years old the unfortunate girl was willfully taught to masturbate, and the habit became fixed, and after three or four years was almost constant, except when she was restrained by force. The intestinal disease showed itself perhaps eighteen months before death, with no evidence of previous infection elsewhere.

The evidences of impaired nutrition with emaciation are first seen. The condition is then soon found to be accompanied with irregular fever and occasional chilliness. At first there may be constipation, with colicky pains, but these are more apt to be an accompaniment of diarrhea, which is difficult of control. The movements are irregular in character, mixed with blood and mucus. Later, as the peritoneum becomes involved, there is diffused tenderness and a shrunken, contracted abdomen, unless there is free effusion, which is not common.

Occurring secondarily to an attack elsewhere, usually in adults, the symptoms are insidious and difficult of diagnosis. The diarrhea, as well as the colicky pains and tenderness, are thought to be due to the digestive disturbances. The fever, which has long existed, is not changed in character. Later, in cases where emaciation is pronounced, and where there is no extreme degree of peritoneal effusion, the nodular condition of the intestines may occasionally be felt through the intestinal walls. An unquestionable diagnosis can only be made by repeated microscopical ex-

aminations of the intestinal mucus obtained directly from the rectum.

Prognosis:—If nutrition can be sustained, these patients may live a number of years, and there is no doubt that a number of pronounced cases have recovered. The tendency is to increase of emaciation, and death from actual starvation, however, in adult cases of a secondary character, the primary affection will continue to advance and may result in death before the intestinal infection has progressed to any serious degree.

Treatment:—There are no specific measures that can be suggested in the treatment of this condition. The nutrition must be maintained at its highest possible point. To accomplish this, all the measures which are suggested in pulmonary tuberculosis must be adopted. These are **pure air, sunlight, proper exercise** and concentrated and persistent **nutrition**. Even more attention must be paid to both gastric and intestinal digestion and assimilation than in other infections. In this disease intestinal peristalsis is apt to be very active, and often the presence of the least food in the stomach will induce almost immediate evacuation of the bowels. This must be restrained. The persistent use of **Fowler's solution of arsenic** in five-minim doses to an adult, after eating, will correct this condition, usually. Assistants to the digestion must be advised, even after the food has been selected with the utmost care. **Hydrochloric acid** is often indicated, and **hydrastis** and **geranium** should be administered persistently, adjusting the dosage, especially of the geranium, to the immediate conditions. **Nux vomica** and the bitter tonics, with persistent use of intestinal antiseptics, are all demanded.

TUBERCULOSIS OF THE LYMPHATIC GLANDS.

Prior to the discovery of the bacillus of tuberculosis this condition was known as **scrofula**. It is a form of tuberculous infection which is mild in character and amenable to treatment and does not necessarily dispose the patient

to general infection. It is very common among children and among young adults up to middle life it is quite frequent. Perhaps the benignity of this form of the infection may be explained by the fact that the lymph nodes antagonize the entrance of infection of a micro-organic character into the system, and may thus inhibit the virulence of the tubercular bacilli. The condition may be local, as when it affects the cervical, bronchial or mesenteric glands, or it may affect the lymph glands throughout the entire body. This general form is usually secondary to local infection of the cervical glands.

Symptomatology:—In the cervical form there may be no evidences of disease until it is apparent that there is progressive enlargement of the cervical glands. Under the finger these are small, hard, distinctly circumscribed nodules, which slowly increase in size until the single glands become as large as an egg. The enlargement is movable and continues hard and firm, until suppuration occurs. With the development of pus there are the usual symptoms of fever, of an irregular type. Usually the loss of strength and appetite is not excessive, but there is general indisposition, emaciation and anemia. This condition may involve all of the cervical glands as well as the axillary glands also. The tumors may coalesce and form large unsightly masses, and the suppuration may open channels or sinuses between the glands. The condition may occur primarily in the bronchial glands and may result in ultimate pulmonary infection. It may be associated with catarrhal bronchitis when there is present cough and fever with considerable bronchial irritation. The sputum is purulent in character and contains blood and caseous matter, in which the bacilli are found.

The condition invades the mesenteric glands, usually when there has been a primary intestinal tuberculosis. The evidences point to a peritonitis, which ultimately may become general, and is accompanied with effusion. Fever is present, irregular in character and irregularly intermit-

tent. The skin is dry and harsh and assumes a characteristic pallor and there is emaciation and anemia.

When the infection becomes general within the lymph glands the usual symptoms of debility, progressive emaciation, a cachetic appearance, with mild fever, are present. The fever is persistent, but seldom high. There is loss of appetite, constipation and ultimately a general inactivity of the glandular organs throughout the system. Malnutrition is one of the common accompaniments of the disease.

It assumes a chronic character in nearly all cases. The danger lies in its inducing an active infection outside of the lymph glands of a more serious type.

The pathological elements of this disease are very similar to those of pseudo leukemia.

Treatment of glandular tuberculosis:—Taken early, this form of tuberculosis is usually quite amenable to treatment. The patient should be put into the best possible condition as to environment. The country air or the sea coast is essential. He should have a thorough sponge bath, followed by a salt rub twice a week. Any disturbance of the digestion or faults in the appropriation of food must be promptly and positively met with the appropriate remedies, and the nervous system must be built up and thoroughly sustained by appropriate tonics, and finally, but most important of all, the blood must receive studious attention. But it will be useless to attempt to correct the condition of the blood and continue the patient in a close, filthy, poorly ventilated city apartment house, with poor food and improper care.

The specific remedy is **phytolacca**. This operates directly upon the glandular conditions, assisting in the elimination of the morbid material. This must be enforced by **echinacea** to destroy the virulence of the infection, and these two remedies must be continued for a long time. With these the **iodid of iron** is important also, although they should be given in alternation, rather than in conjunction. **Ber-**

beris given with **hydrastis** and **collinsonia** and the **carbonate of iron** will be found of much service when a change in the treatment is desired for a time. I have also obtained excellent results from a combination which, while not so scientific, is of pronounced benefit. This is made of **yellow dock**, **alnus rubra**, **phytolacca** and **podophyllum**, the latter in doses just short of producing irritation of the bowels.

Cod liver oil, with or without the **glycerophosphates** or the **hypophosphites** is an important adjunct to the treatment in the poorly nourished cases.

When disintegration takes place and pus forms the fever and constitutional indications must be promptly met. **Aconite** in small doses and **bryonia** must then be given, but the important procedure if the glands are greatly enlarged is excision. Thorough evacuation of all purulent material is essential, but the **excision** of all the tuberculous structures, if not too general, is of much importance. Excision is advised only when the glands are greatly enlarged and when, from constitutional conditions, which do not yield to medical treatment, the enlargement is persistent. Begun early, especially with children, the medical treatment is most essential, and conducted with confidence and positiveness, is curative in a large proportion of the cases.

TUBERCULAR MENINGITIS.

When in the rapid course of the development of miliary tuberculosis the lodgment of the tubercles is made in the pia mater of the brain, the symptoms are those of a basilar meningitis. This occurs quite frequently. It occurs in children principally under eight years of age, but may develop in early adult life.

Symptomatology:—The premonitory symptoms of headache, general distress and indisposition are apparent for a number of days, the appetite is lost, the tongue is coated, there is nausea, and usually regurgitation of food, rather

than actual vomiting. There is gastro-intestinal irritation, with marked constipation, the patient grinding its teeth when asleep and talking, or starting up, in the sleep. The child becomes emaciated and worn-looking, and there is some impairment of the mental faculties. Ultimately a chill occurs, which is followed by fever, the child shows marked signs of irritability and occasionally screams out with sharp penetrating shrieks, and, if old enough, clasps its head with its hands. In some cases there are convulsions early in the disease, with paralysis and perhaps coma. The pupils are contracted at first, and the headache increases to pain, which is aggravated by excitement and noise, and is relieved if the patient be kept quiet and in a darkened room. The fever usually does not rise as high as in the other forms of tuberculosis. The pulse is small and frequent, but not generally above 125 beats per minute. The respiration is only slightly increased at first, the secretions are deficient, the mouth and tongue are dry, the skin dry and rough and the pupils irregular.

In the final stage of the disease the child becomes more quiet, there is less headache, the stupor increases and general convulsions may occur. The facial muscles twitch violently and ultimately there is facial paralysis, or there may be paraplegia. Local paralyses are quite common. As a state of paralysis develops the temperature abates and finally may become sub-normal until a short time before death, when it may rise to 107° or 108° F.

Prognosis:—These cases usually terminate fatally. They may run their entire course in two weeks, but usually about six weeks is the limit; occasionally they will assume the so-called chronic form and may last a number of months.

Treatment:—The fact that a fatal termination is anticipated, must not cause the treatment of the patient to be neglected. Specific indications must be promptly met, but the treatment must necessarily be general in character. A course similar, in its constitutional influence to that advised for pulmonary tuberculosis, should be adopted.

THE PLAGUE.

Synonyms:—Bubonic plague; black death.

Definition:—This disease, which as yet has had no foothold in our country, is characterized by a violent, malignant inflammation of the glands, especially those of the groin, axilla or neck. The disease is acute in character, of specific origin, depending upon the development of the bacillus pestis; is infectious and contagious. High fever is present at first, and certain cutaneous symptoms are pathognomonic. This is a disease of Oriental countries and has as yet prevailed to no great extent elsewhere.

Etiology:—Kitasato and Yersin have demonstrated the presence of the *bacillus pestis bubonicæ* as the especial cause of this disease. The germ causes the development of the disease in insects, vermin, and in domestic animals and fowls, as well as in man. Extreme filth and unsanitary, unhygienic conditions prevail wherever there is an outbreak. While male adults are more liable to become inoculated with the disease, it attacks all ages of both sexes.

Mode of Infection:—The original theory that the germs of this disease were inhaled and taken in with the food has not been substantiated as yet. Direct infection from the bites of insects or vermin and infection through skin abrasions and slight wounds cause this disease. Flies and fleas are thought to carry the infection from rats and other infected animals to man. Ants, mosquitos doubtless, and other insects may act as carriers also.

Symptomatology:—The Plague Commission recognized two forms of this disease, one affecting the lymphatic glands primarily and the other the lungs. Another classification recognizes four varieties. First. The usually predominating form, which presents a long train of severe acute symptoms, with local glandular involvement after the second or third day. Second. The septicemic form, in which symptoms of acute septicemia prevail, affecting the entire glandular system. Third. The pneumonic form, in

which acute pulmonary inflammation occurs as the result of the infection. The glandular system does not escape in this form, but the involvement is not usually pronounced and often is not apparent except upon post mortem examinations. Fourth. The larval plague. This involves groups of glands directly, the buboes appearing without the accompanying constitutional evidences of the first variety, but little, if any, fever or other symptoms, except exhaustion.

The prodromal symptoms of a typical case of the bubonic form of the plague are few, and are seldom long continued. The direct symptoms are, first, an attack of **fever**, with but little, if any, **chill**. With the fever there is **vertigo** and a sudden and very severe **headache**, **nausea**, **vomiting**, **lassitude**, drowsiness, with a dull, stupid look on the face, **pain** in the limbs and back, and a **staggering**, uncertain **gait**, as if intoxicated.

At the end of a few hours there is an abrupt increase of the temperature from 103° to 105° or 106° F. The **pulse** is variable in character and force, but is apt to be small, rapid and thready.

With this, evidences of serious illness quickly appear. The patient exhibits extreme anxiety, the vomiting increases, the face becomes swollen and engorged or flushed. The tongue becomes dry and covered with a brown and later a black fur, and the teeth with sordes, and there may be sudden exhausting diarrhea. The prostration of the patient, which is at once apparent, has no relationship to the duration of the disease, and is quickly accompanied by mental dulness, stupor follows, and delirium, finally low and muttering and ultimate coma, which is usually of uremic origin. So great is the sudden debility in some cases that it amounts to a complete collapse, and death occurs without reaction. Thus far evidences of glandular involvement are not conspicuous, but if the collapse does not occur, or is survived at a period from two to five days after the onset, the lymph glands become involved, usually

the inguinal glands first. The usual evidences of acute inflammation are all present in an aggravated form in the glands, pain being conspicuous. In some cases inflammation terminates by slow resolution, in others the glands become greatly enlarged and no change occurs until death. In still others there is suppuration. It is desirable after the stage of possible resolution is passed that free suppuration occur, especially if the pus be foul smelling in character. If there is but scanty escape of sanious or watery pus the virulence of the disease does not abate. In some few cases the buboes assume the appearance of carbuncles and terminate in gangrene. Skin complications are not unusual; petechiæ, pustular eruptions, gangrene of small circumscribed areas, and small carbuncles occur. A hemorrhagic diathesis is a common complication, from which hemorrhages from the nose, lungs, stomach, intestines and kidneys occur.

If the case is fatal and the patient survives the original collapse, the end occurs on the third, fourth or fifth day. If the disease is prolonged beyond this time the chances for recovery are good, but the convalescence will be greatly protracted.

If the infection expends itself upon the respiratory passages, as in the pneumonic form, the symptoms are those of acute, sudden and extremely severe inflammation of the lungs, with a copious watery sputum, rusty colored or distinctly streaked with blood. Children are more susceptible to this form, to which they usually quickly succumb.

In the septicemic form there is an absence of the evidences of local glandular involvement (buboes), but there is general glandular inflammation. There is a more general septicemic condition with the usual evidences of persistent fever and rapidly increasing debility. These cases are usually hemorrhagic in character.

The larval form prevails usually when an epidemic is abating. The general constitutional symptoms are not conspicuous, but the local bubonic invasion is severe, but

is quite amenable to local treatment. The mortality of this form is not high.

Prognosis:—The death rate has been universally high in the Orient, ranging from fifty to eighty or ninety per cent in prevailing epidemics. The severity depends upon the social and sanitary or hygienic conditions of those attacked. With the best possible conditions among civilized peoples the mortality may not be above fifteen per cent.

The mortality of the pneumonic cases is higher than that of the other types, that of the septicemic next in severity, the bubonic next, and the larval form the lowest.

Treatment:—No specific course has yet been adopted for the cure of this disease. The treatment has been symptomatic and general. The removal of the patients to sanitary environments is imperative. The indicated remedies are as follows: For the acute fever, **aconite** in small frequent doses for a few hours, then followed by **bryonia**, with frequent cool sponging for the high temperature is essential. The above remedies must be given in conjunction with **phytolacca** and **echinacea**, and the two latter remedies should be continued throughout the entire course of the disease, the former in five-minim doses and the latter in from fifteen to thirty-minim doses every two hours. **Belladonna** should be given in frequently repeated drop doses of the tincture during the congestive period. **Echinacea** three parts, **phytolacca** one part, should also be applied freely from the first over the glands, which become involved, by saturating gauze, and covering with rubber protective. As soon as there is marked inflammation in a single gland or group of glands ten minims of **echinacea** should be injected hypodermically into the surrounding tissues or directly into the gland substance, and the external application continued. The **echinacea** may be injected in three or four localities at the same time. Future injections may or may not be of service. If needed, there will be an abatement of the symptoms from the injection,

with an exacerbation later, when the injection may be repeated.

If resolution of the local inflamed glands does not quickly occur, suppuration must be encouraged by dressing them with a gauze mass kept saturated in a full strength boric acid solution or a ten per cent carbolic acid solution, and best applied hot and covered with rubber protective or oiled silk and kept hot. They must be freely opened upon the least presentment of the presence of pus.

Other of our remedies that should be of service in this disease are **veratrum** in five minim doses four times daily when sthenia prevails and no heart weakness threatens or **berberis**, which will be indicated if the skin symptoms predominate. If petechia prevails it should be given with small dose of belladonna, and **capsicum** may be applied externally. **Baptisia** if extreme sepsis, and blood depravations are plainly apparent, and **podophyllum**, may be given, with acetate of potassium, for their influence on glands, if no diarrhea or renal complications exist. **Pipsissewa** should be of much service. Dr. Fox of Connecticut has much confidence in it as a superior alterative in glandular disease. **Iron** is important, not only in convalescence, but during the course of the attack. Another remedy that has been used to much advantage is **carbolic acid**. This has been given by the mouth until some mild physiological symptoms were induced, with good results. Thompson gave as high as twelve grains every two hours. In collapse, three grains in hot physiological salt solution should be given by hypodermoclysis, or in smaller quantity of the solution, five grains could be given twice daily, or one grain in proper solution could be injected into the tissues immediate to inflamed glands in several localities three or four times within twenty-four hours, or into the gland itself, with no harm. Hypodermic injections would be more directly fatal to the bacillus in much less dosage than would be the case if the agent were given by the mouth.

The results of the **antitoxin** treatment of the plague have

not as yet been satisfactory. There is enough to encourage a strong endeavor to perfect the treatment with the belief that it will ultimately be of universal application.

SEPTICÆMIA, PYÆMIA, AND SEPTICOPYÆMIA.

A thorough understanding of the conditions represented in the above title necessitates a more comprehensive and exhaustive consideration of certain etiological factors and pathological conditions than is possible in this work. It will suffice to say the terms **septicæmia** and **pyæmia** were originally used in connection with certain conditions of blood infection, the first when actual "putrid" matter (of unknown character) was supposed to be present in the blood, and the latter—**pyæmia**—when pus cells were floating in that fluid. **Bacteræmia** the better expresses the conditions as now known to exist, of bacteria in the blood. The conditions named in the title include all infections—those caused by bacteria, and those resulting from the influence of those toxins which are the products of the growth, nutrition and development of specific micro-organisms in distinct localities of the body, as the Klebs-Loeffler bacillus of diphtheria or the bacillus typhosus. Also those infections from auto intoxication caused by deficient and imperfect excretion, as uræmia, and the infections caused by the bites of poisonous insects and vermin and rabid and infected animals. **Septicæmia** comprehends systemic infection from various causes; the original infection is not always to be determined, and it is so often of a mixed character that its real nature is difficult of determination. The micro-organisms multiply, reproduce themselves in their progeny, and the processes of their growth and nutrition develop toxins, all of which, with other substances—prod-

ucts of chemical change in the normal body waste—retained, combine to produce the phenomena classed under this head.

Pyæmia in its present acceptance comprehends a focus of necrotic tissue, caused by the peculiar organisms of pus development with pus cells present in greater or less quantities. The location of the primary infection is usually the seat of the first abscess, but the pyogenic organisms are readily absorbed and metastatic abscess is the result. This condition is induced by impeded capillary circulation from the presence of a septic embolus, which acts as a focus of infection and tissue necrosis. These abscesses occur in the various organs, as the liver, spleen, kidneys, lungs, bronchial glands, lymphatic glands, mammary glands, ovaries or testes, or even in the cortical substance of the brain. Abscess is common also in bones and deep muscles, in sub-cutaneous and sub-mucous tissues, and in the salivary glands.

The primary cause of pus production in pyæmia, is invasion by the staphylococcus and streptococcus directly, into cut, wound or abraded surface, but there are other micro-organisms which cause the formation of pus. Among these are the pneumococcus, the gonococcus, the bacillus coli communis, and others of a distinctly specific character. General pus infection is apt to occur in cold weather, more often in males than in females, and in middle adult life.

Symptomatology:—The symptoms vary in septicæmia with the cause of the infection. The period of incubation may be very short if the infection is virulent, or it may last ten to fourteen days when the intoxication is from the products of germ development. There is **malaise** and **headache**, **disordered digestion** and perhaps **nausea**, **vomiting** and **diarrhea**, with perhaps dullness and tendency to sleep. The **temperature** usually increases rapidly, and with most cases symptoms closely resembling those of typhoid fever appear—**suppressed secretions**, dry, narrow, pointed, red tongue covered with a dark fur, dark mucous mem-

branes, **sordes** and **delirium**, or the persistent, moderately high temperature of miliary tuberculosis, with irregular remissions. The fever in any case is continuous, the pulse is small and frequent, and evidences of blood changes are conspicuous. The **spleen** is tender and **enlarged**, and the skin discoloration, as well as that of the conjunctivæ, suggests a mild form of jaundice. **Septic nephritis**, with scanty urine containing albumin and tube casts, or more or less complete suppression, is a common result of septic infection.

In pyæmia, from four to fourteen days after a wound becomes infected, there is a slight **chill**, unless the infection was virulent when it may be very severe. There may be only a primary chilliness which is accompanied by an **irregular fever** varying greatly in the character of its remissions.

It may be irregularly intermittent in character, with much variation in the periods of intermission, or it may be irregularly remittent, or it may be both intermittent and remittent, but usually there is no return to normal during the period of infection. During a marked remission the patient may **sweat profusely** and become quite weak; **exhaustion**, however, is not marked, except in protracted cases. It is difficult from the symptoms alone to distinguish between septic infection and malarial manifestations. There is **anorexia** with disordered stomach; **malaise**, increasing **emaciation**, some **jaundice** perhaps, and usually marked **anæmia**. In marked and protracted cases the face assumes a characteristic expression, sometimes called the *septic facies*.

After a few days evidences may appear of **localization** of the **infection** in some special organ. The lungs, spleen, liver or kidneys show signs of local inflammation. The lung symptoms are not so readily distinguished as are the signs of ordinary inflammation, but the liver and spleen may become enlarged, painful and tender, and the function of the kidneys may be materially interfered with, and albuminuria appears with epithelium tube casts and blood

corpuscles, or direct evidences of pyelitis or pyelo-nephritis may be present.

The impression made by septic invasion upon the kidneys is sometimes most pronounced, resulting in retarded and deficient secretion, and occasionally, as after scarlet fever, diphtheria, typhoid fever, erysipelas, sapremia, and from septic infection after confinement, or after a miscarriage, there may be abrupt and immediate suppression of urine, more or less complete. In these cases, uremic symptoms are apparent in addition to the other phenomena, and convulsions are not uncommon.

Marked gastric symptoms or gastro-enteritis frequently occurs with nausea, vomiting and persistent diarrhea, with large serous discharges. Persistent looseness of the bowels accompanies even mild cases.

The form of toxemia known as ptomaine or tyrotoxicon poisoning (sepsis intestinalis), which occurs from eating canned meats, or sausage, or cold pressed meats which were pressed hot and cooled some hours previously, or from ice cream or cheese, develops usually without fever, but with prostration and a **reduction** of the **temperature**, **cold skin**, with often a marked chill, extreme gastric or **gastro-intestinal irritation** and pain, persistent **nausea**, **vomiting** and **diarrhea**, which may increase, with **mental dulness**, **weak**, **rapid pulse** and **failing heart**, until death occurs. In some cases, after the initial chill, while the surface of the body and extremities continue cold, the **internal temperature** of the body **rises** rapidly to perhaps 103° or 104° F., and in fatal cases the final **temperature** may be **extreme**, 107° or 108° F.

In true sapremia the removal of the cause results in an immediate abatement of the symptoms. And those which have been induced by the condition yield rapidly to treatment.

In direct septic infection of the skin of the extremities, the point of infection becomes tender, painful, swollen, red and hot, and soon redness develops upward over the course

of the lymphatics, with swelling and pain toward the body. Unless at once controlled and the advance of the infection retarded, constitutional symptoms of a violent character, with general lymphatic involvement, may occur.

There are cases of pus infection, in which the cause is not plainly apparent, and where foci of secondary infection do not quickly appear. In these a bacteriological examination of the blood discloses a general diffusion of the characteristic micro-organisms, and a post-mortem examination shows evidences of diffused infection in nearly every organ of the body, with but few if any purulent foci. With these there is persistent temperature, variable but not usually high, occasional chilliness, nausea, anorexia, progressive debility and emaciation, the characteristic hue, leucocytosis, extreme anemia and often jaundice.

Treatment:—In the treatment of septic poisoning the cause must be at once removed. Thorough cleansing and the use of antiseptics are all important. Existing **abscesses** should be **opened** and **evacuated**, and thoroughly irrigated and rendered aseptic. Local points of infection should be dressed with a saturated solution of **boric acid** or a strong **carbolic acid** solution on gauze and evaporation prevented by rubber protective or oiled silk. The skin over the lymphatics, reddened and inflamed, may be painted with tincture of iron.

In uterine or vaginal infection curetting and thorough antiseptic irrigation are practiced. In ptomaine poisoning there is usually complete evacuation of the stomach and bowels as a result of action of the poison.

Where marked depression is present in acute cases this must be combated by **stimulants** and **heart tonics**. Where chill and fever are the primary symptoms these must be positively met with the specific sedatives.

In sthenic cases elimination must be thorough and as persistent as is consistent with the vitality and strength of the patient. **Pilocarpine** at the onset of the fever is essential, but this agent cannot be continued. Where any cause

of infection induces the slightest decrease of elimination by the kidneys I am heartily in favor of applying **extreme heat** to the limit of endurance over these organs, and persisting in that application unremittingly until the kidneys are increased in activity even beyond the normal point. I consider no measure more important than this. This sustains the blood pressure in the kidneys, prevents local septic development there, overcomes albuminuria, prevents and relieves uremic symptoms and stimulates the most essential elimination. When local pus infection is determined and general constitutional invasion is anticipated active alterative treatment should be given in conjunction with elimination. Remedies that directly inhibit pus formation are **echinacea**, **calcium sulphide** and the **tincture of the chlorid of iron**. The first is a truly excellent remedy in septic invasion of any organic character. It has produced really startling results in pyemia, restoring alone to health cases that were apparently beyond all aid. It destroys the pus micro-organisms within the blood, vitalizes that fluid and thence all the tissues of the body, stimulates the nervous system and thus encourages an improved action of the gastro-intestinal tract, encouraging an immediately improved nutrition. Its benefits are more widely diffused than any other single remedy we have at our command. It acts promptly and in a manner difficult to explain. There is at first an abatement of the progressive symptoms. Then improvement slowly appears and continues. The remedy should be given in septic cases in doses of from ten to forty minims every two hours, according to the severity of the symptoms. In cases of direct local infection the remedy in full strength should be applied to the part and even injected directly into the surrounding tissues. A proof of its virtue is in the fact that all who use it immediately become enthusiastic in its praise. This remedy should be given in uremic poisoning in all cases and as a constitutional remedy in puerperal convulsions. The **calcium sulphide** in doses of from one-twelfth to the one-fourth of a grain four

or five times daily has been used freely for some years with satisfaction in certain cases of general infection. The **tincture of iron** is of value where the lymphatics are involved and also in cases of pus formation. Ten-drop doses every three or four hours are required. I have found it available in all cases where pus is found in the urine. **Veratrum** is a most active alterative. It may be given in the initial fever until there is some impression made upon the temperature, and then it may be continued in five-minim doses three or four times daily for its alterative effect, unless debility is marked. **Phytolacca** is indicated specifically wherever the glands or glandular organs are involved. It is an active alterative and restorative in addition to its influence upon the functional action of all glandular structure. It is given conjointly with other indicated remedies. **Podophyllin** may be given in very small doses with phytolacca and also whenever the liver and spleen are involved. It should not be permitted to irritate the gastro-intestinal tract. **Berberis aquifolium** is a remedy of value as auxiliary to other measures when the skin is involved and when pimples, pustules, bullæ, vesicles or skin abscesses appear as a result of the infection. This remedy is given to good advantage when so indicated with small doses of the carbonate of iron. **Quinin** should be given in toxæmia, when the temperature is not too high. It is a stimulant and tonic of much value. Strychnin or strychnin arsenate are valuable for regular administration. During a period of extreme weakness, exhaustion or threatened collapse **hypodermoclysis** with the normal salt solution should be resorted to. It is profoundly stimulating in its influence, but of no less importance is its influence in antagonizing the micro-organisms and their toxins in the blood, and in effecting their elimination. From one-half to two or more pints can be used, much care being exercised in its administration every day in extreme cases. When extreme distention of parts or extreme stretching of the integument has occurred over a mass of fluid injected and not rapidly diffused, there has

followed strangulation, gangrene and sloughing. This must be avoided, as conditions in toxemic cases are more than usually favorable to such a result.

The **feeding** of these patients should be judiciously conducted, especially where the stomach and intestinal canal have been involved. Liquid foods, eggs, milk, gruels, bovine and concentrated, easily absorbable preparations are indicated.

SYPHILIS.

Definition:—Syphilis is a chronic, infectious, contagious disease, characterized by a definite clinical course of six periods: (1) Period of incubation; (2) period of primary symptoms—the chancre; (3) intermediate period between that of the primary symptoms and the development of skin eruption; (4) period of secondary symptoms—skin eruptions; (5) latent period, characterized by absence of lesions; (6) period of tertiary symptoms. The disease may be either congenital or acquired.

Etiology:—No specific micro-organism has yet been discovered, and the search for the infective agent is rendered difficult by the fact that the disease is peculiar to the human race, thus rendering inoculation experiments upon animals impossible.

The disease is usually transmitted during sexual intercourse, but many cases are the result of accidental inoculation, especially of the lips during the act of kissing, or of a finger during examinations, operations, etc., by physicians. Hereditary syphilis is most commonly found in children both of whose parents are diseased. Where one only is affected, the father is more liable to transmit the disease than the mother, and the more recent his contraction of the same, the more certain is he to transmit it. Fortunately, however, infection during the period of gravidity does not always seem to occur, either of the

embryo from a syphilitic mother or of the healthy mother from a syphilitic embryo, and the apparent immunity which seems to be enjoyed in certain cases, during this period and later, has given rise to various theories or so-called laws of immunity, such as Colles'—that the child of a syphilitic father will render its mother immune against the disease, and Profeta's—that healthy children begotten of syphilitic parents are immune against syphilis. Many exceptions, however, have been found to both of these laws.

The contraction of syphilis in its acquired form depends upon the existence of some break in the cutaneous or mucous surfaces, such as a slight fissure or abrasion of either skin or mucosae of the genitals, or in the case of the accidental variety, of the lips or hands. Susceptibility to the disease is universal, and even re-infection, though rare, has been known to occur. The blood during the secondary period, and the secretions from all lesions except the tertiary, are infective. The saliva, sweat, milk and semen do not appear to convey the virus, though the latter is very liable to infect the embryo and through it the mother.

Symptomatology:—The symptoms of acquired syphilis occur typically in three fairly distinct stages, though in many cases these overlap to some extent, thus rendering absolute definition between them impossible.

During the primary stage the general symptoms are negative, but the typical initial lesion—the chancre—makes its appearance usually about three weeks after infection. This, which is also known as the primary sore, *ulcus durum* or Hunterian or hard chancre, begins as a red papule with a hard or indurated base, the surface of which rapidly breaks down and forms an ulcer which may vary in size from that of a pin-head to a silver dollar. When very small, and especially when situated on a mucous surface and presenting no marked evidences, the ulcer may be unnoticed altogether, and thus make the later diagnosis of the condition more difficult. Within

one to two weeks of the appearance of the primary sore the glands of the immediate neighborhood become the seat of a hard and painless enlargement, and non-syphilitic complications, such as phimosis, paraphimosis, balanitis, vaginitis and stricture are not uncommon. The involved glands show no tendency to suppuration and are known as indolent buboes.

The secondary stage is inaugurated from six to ten weeks after infection by malaise, anorexia, headache, languor, impairment of digestion and usually some slight fever— 101° - 103° F., together with general rheumatic or neuralgic pains, exaggeration of reflexes, splenic enlargement, anemia and frequently icterus. Just preceding the appearance of these constitutional symptoms general adenitis sets in, when without the usual inflammatory signs all the glands of the body enlarge painlessly and become hard. The general symptoms already named do not occur in every case, or they may be so slight as to be unobserved by the patient. During this stage and accompanying the aforementioned phenomena, an eruption appears, varying in the type and distribution of the lesions, which are known as syphilides or syphilodermata. These on first appearance are usually macular in character and erythematous in color, though sometimes pigmentary or purpuric. The spots vary from a yellowish-red to a light rose tint, and under pressure the color disappears. They may be few in number and scarcely noticeable or quite profusely distributed, especially on the forehead, chest, abdomen, buttocks and thighs, and when difficult of detection may be made more prominent by having the patient remove the clothing from the trunk, when the diminished vascularity of the skin, incidental to the cooling of the surface, causes them to stand out more distinctly. In some cases a tendency to grouping of the macules may be noticed, and later on a roseola may occur with this tendency still more marked, in which the spots are larger and to a slight degree scaly. The pigmentary syphiloderm,

noticed most frequently in women about the neck, is apparently the result of circumscribed areas of pigmentary atrophy, with contiguous areas of hypertrophy, both irregularly distributed, and causing the skin to appear as though covered with a brown network. It appears early and does not readily respond to treatment. The purpuric variety of this early eruption is most frequently seen in those of low vitality or during a course of vigorous mercurial treatment, and consists of small purplish spots which do not disappear under pressure.

Another early eruption is that of papular syphilodermata, which may be either dry or moist in character, types of the first variety being the ordinary miliary and lenticular cutaneous papules, while the moist includes such lesions as mucous patches and condylomata lata. These syphilides are very common and in color, situation and grouping are characteristic. They may be of any size up to that of a silver ten-cent piece, flat or conical, with color varying from a dark red to a ham color. This eruption in a slightly scaly form is common on the forehead—the “corona veneris”—and is also frequent on the scalp and chest.

The dry miliary variety occurs in patients whose general health has previously been bad; the lesions are pin-head in size, conical, diffusely distributed, copper-colored and may at first be surmounted by small vesicles which later dry up and form small scales. Lenticular papules, somewhat similar in general characteristics to those just described, are the syphilodermata most commonly seen; they are symmetrically distributed, are polymorphous and usually excite neither pain nor itching.

When this eruption affects mucous surfaces it causes flattened infiltrations of varying sizes, slightly raised above the adjacent surface, surrounded by a narrow, reddish areola and covered by a grayish film. They are known as mucous patches, may be single or multiple, are usually painful and later acquire an opaline appearance. Any of the visible mucous membranes may be affected, but they

occasion special discomfort in the mouth, where they evince great resistance to treatment and strong tendency to recurrence. Ulcerative processes may supervene, especially upon the tonsils and soft palate, usually superficial in character but exceedingly painful. A somewhat similar condition arises when the papules appear in a locality where two cutaneous surfaces are in constant contact, as between the nates, where the persistent irritation by the local secretions causes them to proliferate until they become flat; disc-like, warty growths—condylomata lata—which give off an offensive odor and a serous, highly infective discharge.

Usually following the above described papular varieties, but sometimes occurring primarily, syphilodermata of a pustular nature may develop, especially in unclean and poorly nourished individuals. These also may be miliary or lenticular in appearance and upon drying form coarse, dirty crusts from which the term crustaceous has been applied to this eruption in its later stages. Various modifications of these eruptions and combinations of their characteristics have caused them to be distinguished by descriptive designations, e. g., squamous, vesiculo-papular, pustulo-crustaceous, etc., which are self-explanatory. During this secondary stage of the disease, other symptomatic conditions, such as alopecia, laryngitis, iritis, choroiditis, retinitis, and epididymitis, frequently occur. Altogether the secondary symptoms extend over a period of from two to three months to a year or more and are succeeded by an interval varying from a few months to several years, during which the disease remains latent, the individual enjoying, apparently, perfect health. In occasional cases, however, this interval is absent entirely, instances having occurred where tertiary symptoms have appeared during the secondary stage.

Characteristic of the third or tertiary stage are certain skin eruptions, one of the commonest of which is a pustule which dries to form crusts arranged in laminae, somewhat

resembling an oyster shell. This variety is known as rupia. Other pustules may appear, which are tubercular in form, very slow to heal and sometimes manifesting a serpiginous or creeping tendency. Vegetating growths are also often seen among the moist types of eruption. True gummata may form in the skin and subcutaneous tissues during this stage, as in almost all other parts of the body. When they appear in the skin or mucous membranes they form nodules, involving usually only the superficial and subjacent tissues, varying in size up to that of a lemon, the overlying skin remaining normal in appearance until just preceding rupture, when it becomes purplish. When softening sets in they break and discharge a gummy material, to which the lesion owes its name, leaving ulcers, often kidney-shaped when affecting the skin and always difficult to heal. During the process of ulceration and cicatrization a great deal of contraction occurs, ultimately resulting in considerable deformity, which, when the lesion involves one of the tubular organs, such as the esophagus, rectum or trachea, is often attended by stenosis. None of the eruptions mentioned as occurring during the tertiary stage are capable of transmitting the infection; they are not symmetrical in their appearance and are more liable to be attended by itching. Any of the appendages of the skin may be affected in this stage, alopecia often resulting from loss of hair involved in destruction of the scalp; onychia, when the nails are affected, and paronychia, when the surrounding tissues are also diseased.

Periostitis is another common manifestation, causing the development of nodes, especially over the tibiae and forehead, but also on the nose, palate and, though less frequently, upon other bones. They are accompanied by severe pain, especially at night, and also manifest great tenderness upon pressure. These may degenerate into gummata, but usually, unless they are absorbed, undergo fibrous or osseous changes, very rarely suppurating. The lymphatic glands and testicles are often the seats of chronic

enlargement which has no tendency to suppurate. If pregnancy occurs in the female at this time, abortion or miscarriage will probably terminate it, owing either to syphilitic poisoning of the ovum or to the development of gummatous growths in the placenta. These growths may also occur in the internal organs, giving rise to the condition known as visceral syphilis, which, except in rare instances, is the most dangerous form the disease assumes.

The brain or cord may be attacked any time from one to thirty years after the initial infection, and this form of the disease is most likely to occur in those cases in which the early manifestations have either been absent or overlooked. Cerebral syphilis usually affects those in whom the disease has been acquired, but victims of the congenital form are not exempt; imbecility and idiocy being often traceable to this cause. Nervous syphilis usually presents symptoms of one of three conditions: (a) epilepsy, (b) brain-tumor or (c) paralysis. Epileptic manifestations coming on in middle life and not traceable to alcohol or uremia are usually of syphilitic origin. Hysterical or various atypical symptoms may also be presented. Headache, convulsions, optic neuritis and other characteristic symptoms of brain-tumor should, even in the absence of confirmatory evidence or history, excite suspicion of cerebral gummata and lead to trial of anti-syphilitic treatment. Syphilitic paralysis may be hemiplegic in type or may simulate general paralysis (*dementia paralytica*). An atypical paralysis in the presence of syphilitic history will suggest spinal gumma or myelitis.

The liver is another organ frequently affected either with a hyperplasia of the connective tissue elements throughout the organ or with a development of gummatous growths. Neither of these conditions gives rise to any marked symptoms until the resulting contraction causes pressure upon the portal vein or its branches, when the usual evidences of portal obstruction will appear. Some pain is also frequently present, with tenderness upon press-

ure over the painful area, while the syphilomata may often be detected by palpation as rounded prominences upon the hepatic surface.

Syphilitic ulceration may involve any part of the gastrointestinal tract, being especially common in the neighborhood of the two orifices. The oral manifestations have already been described and similar conditions may affect the stomach or intestines, occasionally leading to perforation and peritonitis. Gummatous growths may develop in the tongue, pharynx, esophagus, stomach, and especially the rectum, the involvement of the structures of which, is more frequent in women than in men, often resulting fatally from the subsequent stenosis. The lesions are usually situated close enough to the anus to be detected by digital examination, when the edge of the cicatricial ring can be made out. This evidence, together with the history of the case, will insure recognition of the condition if cancer can be excluded by the absence of the characteristic margin of a cancerous ulcer.

Syphilis may, though rarely, attack the lungs, causing the development of (a) pulmonary gummata, (b) interstitial pneumonia or fibrous infiltration, or (c) fetal pneumonia characterized by appearance of miliary gummata which coalesce to form what Virchow described as "white hepatization." The symptoms will probably be too indefinite to give rise to more than a suspicion of the true nature of the condition, and the results of a therapeutic test will be necessary for its recognition. In the heart there may develop (a) gummata, (b) a form of fibroid myocarditis, or (c) a sclerotic type of endocarditis. The symptoms will be similar to those attending these conditions from any cause as described under Chronic Valvular disease. The arteries may suffer from an obliterating endarteritis in which the lumen is gradually occluded by the proliferation of subendothelial tissue, or from gummatous periarteritis which predisposes to aneurism and atheroma.

Amyloid degeneration of the kidneys is a common sequel

of syphilis, and these organs may also be the seat of the development of gummata.

The joints may present synovitis, acute during the secondary stage, chronic in the tertiary, perisynovial gummata or arthritis. The pain in these conditions is usually severe at night, especially when due to the presence of bony nodes.

The testicle is frequently the seat of a nodular gummatous enlargement, characterized by the absence of pain. An interstitial orchitis of a fibro-sclerotic nature and leading to gradual atrophy is also a common condition.

All the symptoms heretofore described have been those of the usual chronic form of syphilis. There is also a rapidly fatal form of the disease known as malignant syphilis, fortunately of rare occurrence, in which the course is very rapid, tertiary symptoms manifesting themselves as early sometimes as the second month and resisting all treatment.

Symptomatology of Congenital Syphilis:—In congenital syphilis the characteristic symptoms usually appear between the first and fourth months after birth. Occasionally, however, there are present at birth well-defined evidences of the condition, such as marked emaciation, a general appearance of senility with wrinkled and flaccid skin, snuffles, pemphigus neonatorum appearing as bullae on palms and soles, fissures affecting the mouth and anus, ulcers on the mucous surfaces, hyperostoses of long bones or enlargement of the liver and spleen.

Usually, however, the child is apparently in good physical condition when born, but about the second or third month a syphilitic rhinitis appears, causing a sero-purulent or bloody discharge from the nose and obstructing the breathing (snuffles). These symptoms are due to the presence of a rhinitis which is very apt to be followed by ulceration leading to necrosis of the nasal bones and ultimately resulting in a sunken nose, which is a highly characteristic deformity. The spreading of the rhinitis often leads to the development of a middle ear inflammation accompanied by deafness and otorrhea, and the ends of the long bones

frequently exhibit inflammatory symptoms. The skin becomes grayish-yellow in color, a coppery-colored erythematous eruption may make its appearance over the buttocks and genitals, or papules may distribute themselves over these localities. Palmar and plantar pemphigus will probably develop, the nails frequently become inflamed, labial fissures and mucous and cutaneous ulcers are often seen. The hair is generally slow in its growth and falls out, the lymphatic glands enlarge slightly and the liver and spleen frequently manifest enlargement; that of the latter being specially significant. Restlessness is the most prominent nervous symptom and the presence of shooting pains is indicated by the constant utterance of a shrill, harsh cry.

"Syphilis hereditaria tarda," by which is meant the appearance of lesions between the seventh and eighteenth years in individuals who have shown no symptoms during childhood, is indicated by various stigmata, such as a generally undeveloped condition of the body, with muddy complexion and scanty, late-appearing hair. Numerous scars in the skin or mucous membrane of some limited area of the body-surface, are often found, particularly in the mouth, nose, soft palate and over the buttocks. The skull usually presents a disproportionately long transverse diameter and is flattened in the middle; the typical hydrocephalic contour, or general lack of symmetry, is also suspicious. The sunken nose, "sabre-shaped" tibia and pigeon-breasted thorax are other characteristic bony deformities. The testicles may be infantile in type, due to atrophy. Hutchinson's triad of stigmata, which includes abnormal conditions of teeth, eyes and ears, is pathognomonic; the permanent superior central incisors are peg-shaped and betray crescent-shaped erosions of the cutting-edge, the teeth in general may also be irregular in arrangement, number, shape and time of appearance; the cornea presents a reddish patch due to interstitial keratitis, choroiditis or iritis frequently accompanies it; in addition

to the otitis media with consequent otorrhea and interference with hearing previously mentioned, there develops an incurable deafness apparently of labyrinthine origin.

Diagnosis:—It is often very difficult to determine the exact nature of venereal lesions and sometimes it is impossible, in which case it is necessary to wait for the appearance of the first secondary symptoms before making a positive diagnosis. A few of the most characteristic features of the hard chancre, which will help to distinguish it from the chancroid, are: It occurs in those who have never had syphilis; no specific germ can be demonstrated in the secretion (the bacillus of Ducrey and Unna is present in the chancroidal discharge); incubation-period is always over ten days, varying from ten to thirty days (in the simple venereal ulcer this period is always under ten days); the lesion may be rounded or oval, usually presents but slight erosion, gives off a clear serous fluid, is usually single, not being auto-inoculable, and the base and adjacent tissue manifests a characteristically indurated feeling; is followed within a few weeks by systemic and other secondary symptoms. It is especially important that care be exercised in the diagnosis of extra-genital chancres, which constitute, according to some authorities, from one-sixth to one-seventh of the total number of cases. Whenever a sore of any kind occurs about the lips, finger, nipple, anus, or elsewhere, which is slow to heal, the possibility of its being a chancre must be taken into consideration.

When the history of a primary lesion is clear, the secondary symptoms will not usually be difficult of recognition, although the presence of complicating eruptions may for a time confuse the diagnosis. It should be kept in mind that the larger number of secondary siphilides show no acute inflammatory symptoms, but rarely cause pain or itching and are symmetrical in their distribution.

In the determination of the existence of syphilis in the tertiary stage the following points are important: (a) obscure cases of various kinds and symptom-groups not typi-

cal of any well-recognized condition are often due to a syphilitic dyscrasia; obtain, if possible, by careful inquiry direct information as to the actual occurrence of the primary and secondary stages, keeping in mind the fact that these are sometimes denied, though they certainly have existed, or that they may have been so mild as to be unobserved; examine the patient closely for the remains of old lesions, such as iritic adhesions, cutaneous and mucous scars, nodes upon bones or areas of depression, indicating loss of substance due to pre-existing necrosis, and the testes for evidence of sclerotic atrophy; bear in mind the significance of nocturnal pains, deafness, which may be bilateral and present no pathologic lesions explanatory of same, paralysis of single cranial nerves, etc.; the therapeutic test may be necessary in obscure cases.

Conditions in which errors of diagnosis have most frequently been made are: labial and other extra-genital chancres have frequently been regarded as of carcinomatous origin; chronic cutaneous eruptions and the exanthematous diseases, especially smallpox in the pustular stage, have often been mistaken for secondary syphilides; syphilitic arthritis in the secondary stage must be distinguished from the rheumatic type of the disease, and in the tertiary stage, from the arthritis of chronic gout or rheumatism; periostitis, with the subsequent production of nodes similar to those seen in syphilitics, may follow typhoid and typhus fevers, smallpox or vaccination.

Prognosis:—Syphilis must always be regarded as a grave and chronic disease, and it is not possible to state in any particular case, the length of time for which treatment must be persisted in to insure non-recurrence. At the same time the disease is now regarded as perfectly amenable to treatment, provided the latter is systematically and persistently carried out. Permission to marry should be withheld in all cases where the patient has not been subjected to thorough and prolonged treatment, and even where vig-

orous treatment has been undergone marriage should be prevented until the elapse of four years since contraction of the disease. In the tertiary stage however, especially of severe cases, and in malignant cases, a modification of the progress of the disease, and of the severity of the symptoms is about all that can be promised. It is doubtful if more can be accomplished, with any course.

Treatment:—In the treatment of this disease the three stages must be considered separately. It was Prof. King's opinion that there was no infection of a general character until the papule ulcerated. He advised the immediate cleansing of the ulcer and that it should be at once thoroughly cauterized with full strength **nitric acid**. He treated all ulcers with suspicion, the mild ones as well as those which were plainly infective in character. This opinion was confirmed in his mind by the fact that in over thirty years' experience in the treatment of many hundreds of cases but few cases of the constitutional disease developed after this treatment.

I have followed this same course myself for nearly an equal number of years with excellent results. My plan is to cleanse the ulcer thoroughly, in whatever stage I find it, evacuating any contained serum or pus. I then dip a toothpick into fuming **nitric acid** and touch the entire surface of the ulcer and especially its edges. I then apply a powder made of seven parts of **bismuth subnitrate** to one part of **boric acid** rubbed very thoroughly together. If after three days there is still any point on the ulcer that looks red and irritable, I cleanse it thoroughly and re-apply the acid. I have never made more than two applications. This agent, while somewhat severe for a few moments, does the work very effectually and promptly. Care must be taken that no excess of acid be on the applicator and if the effect of the application persists with extreme pain for more than one minute, a solution of **soda** or other alkaline solution to neutralize the acid may be applied.

Inasmuch as we cannot know to what extent infection

has taken place I am a strong advocate of beginning the constitutional treatment at the time of the treatment of the sore, and it is not a bad plan to apply at once and repeat daily the compound tincture of **iodin** over the inguinal glands, as a precautionary measure against the development of buboes.

For constitutional treatment preliminarily, I would give the patient a mixture, each dram of which contained one drop of specific **podophyllum**, ten drops of specific **phytolacca** and twenty drops of **echinacea**, this to be taken every three hours, unless it should act too freely upon the bowels, when the quantity of podophyllum should be reduced one-half for a short time. If there be no infection the remedy will do no harm, and if the infection should be severe the remedy will anticipate its development and be ready to antagonize the infective principle as it develops. If in the course of three weeks the ulcer has healed and no local or general symptoms of infection appear the remedy may be given only three times a day, to be dropped entirely at the expiration of three weeks more if no symptoms appear, or to be increased if the symptoms appear.

With the first appearance of glandular enlargement the tincture of iodine should be used externally and phytolacca should be given internally to its maximum dosage. Febrile symptoms must be immediately treated with **aconite**, and it is an excellent plan to give from ten to fifteen grains of **potassium acetate** three times a day during the development of the glandular inflammation.

The throat should be treated as soon as any soreness appears with a gargle composed of an infusion of **white oak bark**, three and one-half ounces, **boric acid**, two drams, and the **tincture of myrrh**, four drams. This gargle should be used very freely.

Immediately evidences of constitutional infection appear, a plan of treatment must be laid out which will extend over a period of from six to twelve months. It has been my custom to select from among our vegetable alteratives

those which seem to be more specifically indicated, and persist in these for from six to eight weeks, being constantly on the alert for new indications. If these should appear, the prescription should be changed to meet the indications. At the expiration of the time named I have changed the formula to other well selected alteratives, and continued these for an equal length of time, to then return to the original formula or to some other equally efficient combination which would seem to be indicated.

The remedies I first named I consider the most active, and have often continued these in varying doses and with other alteratives during a period of five or six months, without interruption. I have at this moment in mind a very thoroughly infected case in a man forty-nine years of age, with a previous good history; he took the above combination for six months, with two periods of three weeks each, in which he took the baths at Hot Springs, Ark., with complete recovery at the expiration of the period named. I had him under observation for eighteen months subsequently, during which time his anxiety lest symptoms of the disease should appear was intense, but no trace of the disease manifested itself. This case had neither **mercury** nor the **iodids** at any time.

Some of the specific indications for the remedies are as follows: *Echinacea* is of general benefit, influencing the blood-making organs throughout the system and antagonizing the development of the infective material. It may be given in any combination, although I prefer to give it in alternation rather than in combination with the **iodids** when they are indicated. *Podophyllum* exercises its alterative influence by preserving the integrity of the liver and promoting its normal functional action. It should never be given in a quantity sufficient to produce any gastro-intestinal irritation. *Iris* works much in the same manner, but I believe has a wider influence; it is of benefit when the eruption is at its worst, at which time it should be given in conjunction with **berberis**. *Iris* is a general

glandular stimulant and in this it is an excellent auxiliary to the other alteratives. The influence of berberis is almost solely upon the skin, and in proper combination its action is very satisfactory. Phytolacca is our reliable remedy for glandular difficulties. So direct is its influence upon all glands, especially those of the lymphatic system, that we do not hesitate to give it during the entire course of the treatment, to preserve the integrity of these important organs, and to stimulate their influence in antagonizing the development of the infective principle. **Corydalis** exercises a satisfactory influence where there are syphilitic nodules of the bones or syphilitic ulceration; it antagonizes the breaking down of tissue, and exercises a stimulating effect upon all the emunctories, especially those of the skin and kidneys. It influences the elimination of morbid material in a very satisfactory manner. **Chimaphila** exercises an influence that goes hand in hand with that of phytolacca, greatly increasing the efficacy of that remedy. **Kalmia** was a remedy much prized by Dr. King in this disease; he believed that syphilis in mild cases could be cured with this remedy alone. He advised it when there were conspicuous symptoms of a disordered liver or an enlarged spleen as a result of the syphilitic infection. **Plantago** is a remedy that was very highly prized by the older eclectics in the treatment of this disorder, they gave it in infusion and persisted in its use. The specific remedy is a very excellent preparation. It may be given in from two to ten minim doses. It is certainly an active alterative and exercises an efficient influence. **Sarsaparilla** and **stillingia** are among our older and better known alteratives, their influence is a general one. I used the syrups of these preparations as the vehicle for the administration of the more specific alteratives. **Polymnia** is indicated when there seems to be a persistent inclination toward enlargement on the part of the glandular organs, where there is a plethoric condition of the system, with passive fullness of the circulation, with a general tendency to passive engorgement. An occasional

case will be greatly benefited by it. **Thuja** is a remedy for protracted cases, it acts upon chronic disease of the laryngeal or post-nasal region. It acts upon veruccæ and upon any enlargements of a persistent character affecting the bones or muscular structures.

Veratrum is an important alterative and has been given in doses of five minims of the tincture three times a day, in syphilis, with excellent results.

The **iodids** exercise their most direct influence in the tertiary stage of this disease. I believe, however, in giving them early, but prefer to give them as I have stated concerning echinacea, in alternation rather than in combination. I would have a saturated solution of **sodium iodid** prepared, of which each minim would represent a little less than one grain of the iodid, of this the initial dose should be about five minims, administered four times daily in half an ounce of water. This may be increased by one minim each day until the patient is taking twenty minims, if no disagreeable symptoms appear. The sodium salt exercises a full alterative influence with the least disturbance of the stomach. If there be any chronic stomach disorder, which prevents the administration of this class of remedies, the **strontium iodid** may be given, which in some cases improves the condition of the stomach, while exercising its alterative influence. The potassium salt has no advantages over either of these compounds and is usually very irritating to the stomach and more difficult of elimination, causing an irritation of the kidneys and also of the skin, which results in acne often of an intractable and persistent character. When there is renal irritation during the period in which it is deemed advisable to administer an iodid, the **lithium** salt will be preferable.

A course of treatment carried out strictly in accordance with the indications for the remedies named will effect a complete cure of this disease in a period of time usually shorter than that demanded for mercury, and it leaves the patient in excellent tone, and with no impairment of any

of the organs. I am in favor of systematic bathing, including the use of frequent hot baths, or the Turkish bath. Attention to the habits of the patient, to his mode of living, diet, and other hygienic conditions, must be assiduous on the part of the physician.

LEPROSY.

Definition:—A chronic disease, infectious in character, caused by the bacillus lepræ, a micro-organism of great vitality and persistence, but of feeble activity, discovered by Hansen in 1871. The disease is characterized by the appearance in the skin, mucous membranes, and occasionally in the viscera, of tubercular masses (tubercular leprosy), or by a similar involvement of the structure of the nerves (anæsthetic leprosy). The changes in the nerves and in other structures are at first separate, but ultimately they intermingle until no distinction can be made.

Symptomatology:—The disease attacks all alike who have been brought persistently into contact with the infection. It seldom occurs in patients under six years of age and is most common in individuals between the ages of twenty and forty years. The course of the development is protracted usually three or four years. At first there are symptoms of acute illness, as **chilliness**, **fever**, **anorexia**, general **depression**, **dulness** or drowsiness and **feebleness**, resembling the symptoms that occur in syphilis preceding the eruption.

With **malaise** there are severe aching pains in the head and also in the joints, with **epistaxis** and occasionally exhausting **sweats**. This condition may continue irregularly for months before eruption appears. In the tubercular form, which attacks the skin and mucous membranes, at first there are **patches** or **macules**, which are hyperæsthetic and pigmented. Ultimately the sensitiveness disappears, as

well as the color, the skin assuming the appearance of distinctly circumscribed white patches. The nodules appear on the face and in the structure of the ears, as hard, flattened masses, movable and distinct, without sensitiveness. There is an increase in the growth of the skin, which ultimately forms into folds or masses, which has classed the disease in the past as one form of elephantiasis. The nodules increase until the entire surface of the body may be covered. The space between the nodules may be white and smooth, while the nodules themselves will break down and ulcerate, producing an offensive distortion, characteristic of this disease.

During the development of the macular stage of this disease, a **neuritis** develops, which, at first, produces extreme sensitiveness. Ultimately the nerve function is destroyed and sensation is absent. Eruptions occur along the course of the nerves, which result in extensive destruction of tissue, and final loss of the smaller extremities, beginning with the tips of the fingers and toes. Atrophy of both the muscles and skin occurs, later on producing much deformity and mutilation.

Prognosis:—This disease has always been considered incurable. Notwithstanding the persistent study during the last few years but little advancement has been made in a knowledge of the methods of cure; however, there are cases which have recovered. Spontaneous recovery has been known to occur among those who were isolated, and, more recently, positive claims have been made by experimenters to cures of a satisfactory and permanent character. Many cases develop so slowly that the patient enjoys reasonable health, and is able to accomplish an average amount of work for a number of years before sufficient deformity or mutilation occurs to effectually incapacitate him.

Treatment:—The **systematic isolation** or **segregation** of lepers has been practiced in many countries for years. The object has been the prevention of the spread of the disease, more than the cure of those segregated. In many

countries no measures are taken for the improvement of these patients, they being left to care for themselves. In other cases they are provided with comfortable and hygienic surroundings and with proper food, after they become unable to care for themselves.

In 1888 Unna published articles advising a method of cure, which received his name. This consisted of painting the affected parts with **pyrogallic** and **chrysarobic** acids, and applying a **plaster-mull** which is composed of a combination of **creosote** and **salicylic acid**. The patient was given **ichthyol** internally. The same year extensive observations were made concerning the use of **chaulmoogra oil**. This was given internally in dram doses, and very satisfactory results were said to have been obtained. In some cases it was administered hypodermically. **Gurjun balsam** was also used about the same time, and good results were claimed. The use of **gynocardic acid** externally and the internal use of the oil of **gynocardium** have produced satisfactory results in a few cases. We would advise that the persistent external and internal use of **echinacea** be made in order to observe its influence. It should be beneficial. Claims of benefit from the use of **calotropis gigantea** in this disease, and also for **hoang nan** and **kava kava** have been made but are not substantiated.

HYDROPHOBIA.

Synonyms:—Rabies; lyssa; la rage.

Definition:—A specific, highly infectious disease, originating in carnivorous animals, naturally in wolves and dogs, and thence conveyed to other animals, and to man. Its characteristics are an apparent dread of water, from which fact the name is derived; great restlessness and nervous excitability and spasms of the larynx and pharynx; ultimately paralysis, delirium, coma and usually death. A small percentage only of the cases recover.

Etiology:—The virulence of the disease is exercised upon the central nervous system, but the cause is not determined. In diligent search for a micro-organism several investigators claim to have found a specific germ, and Memmo claims to have reproduced the germ, and by the inoculation with it, of dogs, birds and rabbits, to have successfully reproduced the disease.

Pasteur reproduced the disease by inoculating healthy animals with the actual diseased brain substance. The poison is found in the nervous tissue and in the saliva, but is not found in the blood nor urine. As commonly met, a dog in which the disease has developed without known cause, has bitten other dogs, small domestic animals, cows, horses or children, before it was known that it was infected. In a few cases an actual epidemic has been spread in a community from this original cause. In Russia and other countries where wolves abound in large numbers it originates in a single animal and is conveyed ultimately to a pack and thence to other animals, wild and tame. Cats, skunks and small rodents have been infected and have spread the disease. A man suffering with the disease has bitten and thus infected another. It is always conveyed by direct inoculation through a wound or abrasion.

There are isolated cases in every large city every year. If the animal is killed before it inoculates others, there may

be but a single case, and in any event but few cases occur from a single cause, and then the disease disappears again. The disease may be immediately stamped out by muzzling all dogs and killing those at once which have been bitten, although not above twenty per cent of those bitten will develop the disease.

Symptomatology:—The period of the incubation of the disease may extend from two weeks to two years, and claim has been made of the occurrence of the disease several years after infection. If the rabid animal in the virulent stage of the disease inflicts a direct punctured or lacerated wound, and more especially if a child instead of an adult be bitten, the premonitory symptoms of the disease may appear within a few days. These symptoms, which will last only from two to perhaps four days, are great mental depression and apprehension, especially in one who realizes the danger. The part injured becomes red, slightly inflamed and itches, and sharp pains radiate from it, giving the patient constant uneasiness. The wound, which may have healed naturally, may open, vesicles may form around or upon its edges, and the contiguous lymph glands may become swollen and tender. With these symptoms restlessness increases and after four or five days difficulty in swallowing is apparent and there is evident embarrassment of the respiration.

A pathognomonic symptom is the spasm of the pharynx that occurs even upon sight of water, and desire for water—thirst—is an early and most aggravating accompaniment. Great nervous excitement rapidly develops, the jaws snap together, as if the patient was biting at all objects, and he often is constantly spitting. Hyperesthesia to a marked degree is a common symptom with muscular spasm. There will be paroxysms, in which all symptoms are exaggerated, to be followed by periods of quiet, and perhaps dulness. The fever is not high, seldom rising above 102° F., and more often absent entirely. The pulse is irregular, usually rapid in the latter stages. The mind early becomes affected, and in some cases suicidal tendencies develop. The disease

runs its course to a usually fatal termination in from eighteen hours to five days.

A paralytic form of the disease develops in rare cases, usually where there has been serious laceration, and where the bites were deep. This form terminates fatally within twenty-four or thirty-six hours. Paralysis appears at the seat of the injury and extends toward the nerve centers until the respiratory centers are affected. Symptoms of this character sometimes terminate a case which has previously exhibited all the premonitory evidences.

Diagnosis:—The diagnosis is usually made through knowledge of the injury having occurred and by the pharyngeal spasm. The fear of water and great apprehension are also apparent. The real condition must be differentiated from hysterical rabies and from tetanus. The hysterical form may develop from solicitude, and all evidences will abate upon use of profound sedatives or nitroglycerin or nitrite of amyl. Tetanus has tonic spasm of the jaws without intermissions and no great degree of anxiety.

Treatment:—When the disease has fully developed no known method of treatment has as yet successfully combated it. **Pasteur's method of inoculation** is the only known method of prevention, and this occasionally fails. Pasteur, by long continued investigation, determined the fact that if the virus of hydrophobia were injected into a rabbit, and from rabbit to rabbit, the virulence of the poison increased and thus shortened in each consecutive individual the period of incubation. The virulent spinal cords of these animals were preserved for a definite time in dry atmosphere, when the virulence would abate. An exact difference in degree of virulence was determined and definite emulsions were prepared from these cords. From persistent experiments upon dogs a course was determined upon for man, which is now generally adopted. This course is to inoculate the patient as soon as possible after the infection with a mild emulsion, then at regular intervals with those emulsions of increasingly greater virulence, until complete im-

munity is acquired. A more intense course is adopted in cases where much time has elapsed since the bite was inflicted, or where the evidences are that the bite was directly inflicted upon a bare surface, than in those cases where the bite was not severe, and was inflicted through some medium.

As a result of this treatment in the Pasteur institute in Paris the mortality is only 0.5 per cent. In the New York institute it is a little greater than 0.6 per cent. In the Chicago institute, under Doctor Lagorio's careful management, during the past fifteen years twenty-four hundred patients have been treated, in whom there was sufficient evidence that there was actual infection. Of these only seven have died—a mortality of less than 0.3 per cent.

It is always advisable that when an individual has been bitten to thoroughly cleanse the abraded surface and to widely open a punctured wound. These should be immediately cauterized with carbolic acid, nitric acid or caustic potash. Severely lacerated wounds should have all torn and mutilated tissue removed and the lacerated surfaces thoroughly cleansed and cauterized. Incised wounds should not be allowed to close for perhaps four weeks if the animal is proven to be rabid. If the wound be on an extremity it is well to apply a tourniquet between the wound and the body until the wound is cauterized. When there is doubt as to the origin of the disease in the animal the patient should be sent immediately to a Pasteur institute.

We have specific remedies that will modify the symptoms to an extent, and it is our duty to ameliorate the distress by every means in our power. Where an individual is bitten by a dog proven to be rabid, each animal bitten should be kept isolated until the disease develops characteristically. When all proofs of the disease are made and all the evidences are satisfactory, the animal should be shot, and other animals should be carefully inoculated with portions of the brain structure, or tissue from the cord, to determine that the disease is transmissible from it.

Echinacea must be thoroughly tested as a remedy in this disease. In patients that cannot be taken to a Pasteur institute the wound should be thoroughly injected with full strength echinacea, as well as the surrounding tissue. The wound should be dressed with gauze, saturated with the remedy and covered with rubber protective. From half a dram to a dram of the remedy should then be given internally every two hours. If any symptoms of the disease appear the wound should be reinjected and dram doses should be given every hour. We have the best of reasons for believing that the agent will be of service. It has antagonized to a greater or less degree the effects of every organic poison where it has yet been used. It has been successful in tetanus without doubt, and has saved the lives of hundreds bitten by rattlesnakes and other poisonous reptiles and insects. It is at least our duty to give it a most thorough trial and to conduct all investigations and experiments in the most scientific manner, that we may be enabled to prove or disprove its influence in this disease.

TETANUS.

Synonyms:—Lockjaw ; trismus.

Definition:—An acute infectious disease, characterized by tonic spasm of the muscles, first of the jaw and neck ; later of the trunk and limbs.

Etiology:—The disease is caused by the development of a specific organism, the bacillus of tetanus, which is introduced usually through a puncture or abrasion of the skin.

Microscopically the bacillus appears as a short, rod-like body with one enlarged end, the whole shaped like a drum-stick. It is anaërobic and is capable of producing a toxin which is highly poisonous in character. The disease prevails in temperate as well as in tropical climates. It is common in early summer months and seldom occurs after

the month of October. The germ prevails in garden soils and especially around barns and in manure heaps where animal excreta are in process of decomposition, and is of very common occurrence in horses. It develops in wounds, most frequently those of the feet and hands, or punctures by rusty nails and by steel instruments, which are soon closed and not drained. A prick of a pin, a scratch or an abrasion so small as to entirely escape observation, may serve as the point of introduction of the germ. It is also introduced through abrasions of the mucous membranes of the mouth. Open or incised wounds, with free hemorrhage and subsequent free drainage are not so apt to become infected. The toy pistol, which explodes and forces fragments of the percussion cap under the skin, has probably produced more deaths from this disease within the past fifteen years than any other single cause. It has followed the use of contaminated virus in vaccination in several marked cases within the past five years.

The disease attacks new-born infants (*tetanus neonatorum*), especially in hot climates. It is at times epidemic in hospitals and in camps of laborers. It occurs most frequently among men and barefooted boys. It is common to workers of the soil, gardeners, laborers and to those who work around barns and stables. So-called cases of idiopathic tetanus occur from unknown cause, usually during the progress of other disease. It may occur during previous good health from sleeping on the damp ground and from wearing wet clothes and exposure to cold.

Symptomatology:—The period of incubation is of variable length, from a few days to several weeks. In idiopathic cases it may occur in two or three days. In *trismus neonatorum* before the fifth day. There is **malaise, languor and headache**, during which stiffness of the jaw—**lockjaw**—occurs, with difficulty in the mastication of food, and soon stiffness of the muscles of the neck and difficulty in swallowing. The muscles of the face become fixed, giving the face a peculiar expression, known as the **risus sardonicus**.

This peculiar expression may be observed before the patient has noticed that his jaws were stiff. Quickly following, rigidity of the muscles of the back occurs, and the spine is slowly bent backward, producing opisthotonus. Very occasionally the body is bent to one side, or contracture of the abdominal muscles bends the body forward. The legs become extended and fixed, but the arms and hands are the last to be affected. The rigidity in all the muscles is permanent, but convulsive seizures may occur, which cause agonizing pain, great difficulty of breathing and cyanosis. Spasm of the diaphragm is a most painful and serious complication. There is some slight elevation of temperature, usually, and in exceptional cases it increases suddenly to an extreme height, perhaps 110° F., from probably paralysis of the heat centers, the pulse becomes rapid, quick, hard, especially during spasm, and ultimately feeble and irregular from exhaustion. Reflex irritability is increased. Profuse perspiration is common, but defecation and urination may be impossible, or they may be involuntary from muscular contraction. The mind remains clear and consciousness is usually retained unto the end.

There are cases of tetanus classed as **chronic** in which the muscular rigidity is the only symptom at first, and this increases very slowly, to a given point, when it no longer advances for a time, or it may recede and the patient recover spontaneously, or there may be an improvement in the symptoms with a relapse and a recurrence of the condition of spasm. This may be severe and painful for a time. It may involve only the masseter muscles or the muscles of the neck and may interfere slightly with deglutition.

Diagnosis:—The rigidity or fixedness of the jaw, due to the spasm which is described by the patient as “stiffness” of the masseter muscles is usually the first conspicuous symptom, and is diagnostic. No other disease exhibits this peculiar characteristic. **Tetany**, a disease of childhood, has more or less permanent rigidity of the muscles of the hands and feet. This sometimes affects the

larynx. It has distinct remissions, however, and does not affect the masseters and is seldom a serious disorder. Hydrophobia has usually an unmistakable previous history. The constitutional symptoms are much more severe, and permanent contracture or opisthotonos is absent.

In strychnine poisoning the spasms occur with no premonition very soon after a poisonous dose of the agent is taken. They are violent and clonic in character, involving the muscles of the extremities and of the spine, and they do not affect the masseter muscles early. The period of intermission between the spasms is complete in strychnine and become shorter with increased length of spasm until death, which is delayed only a few hours at the longest. In tetanus there is no intermission, only remission, and that not pronounced. There is rather slow involvement of the muscular structure for two to five days in acute cases from the masseters downward until almost the entire muscular structure of the body is in a state of contracture. Hysteria presents some symptoms that simulate tetanus, but they occur only in women of the neurotic type and are usually accompanied with spasmodic laughter and crying, without change of pulse or temperature. They are readily distinguished.

Prognosis:—The mortality from tetanus is from seventy-five to eighty-five per cent in acute and severe cases, in adults, and from fifty to sixty per cent in cases of slow development. In children the disease is usually fatal. Only a small percentage recover.

Death may occur on the second day in the more acute cases, or life may be prolonged in agony until the fifth or sixth. In the chronic cases the spasms may slowly increase for weeks and the patient die from inanition.

Treatment:—If this disease is anticipated all wounds should be freely **opened**, thoroughly **cauterized**, but with a minimum of injury to the tissues that are intact, and the wounds should be disinfected or thoroughly irrigated with normal salt solution. They should be kept open, and

should be made to heal by granulation from the bottom of the wound outward. If the spasm occurs before the disease is anticipated irritation and sensitiveness will point to the wound where the infection was introduced. It may have healed naturally. It should be opened widely and any foreign particles searched for. Scars or cicatrices should be incised or entirely removed and the wound thoroughly irrigated and kept open.

The care of the patient and the treatment may mitigate the severity of the disorder, and must lessen the pain. The patient must be kept secluded and quiet, and be attended by a strong, self-reliant and experienced nurse. Nutrition must be forced persistently, and if necessary the food should be predigested. As soon as swallowing becomes difficult the food must be introduced per rectum. Medicines have not as yet exercised any specific influence. In 1884 this author advised the students of the Chicago Veterinary College to inject hypodermically in horses afflicted with tetanus, dram doses of a good fluid extract of the green root of *gelsemium sempervirens*. This proved to be so much more satisfactory in its results than any previous treatment, that it has since come into almost general use with veterinarians.

It has not been so freely used in human patients but good results from such a course have been observed. Specific *gelsemium* is the best form for hypodermic use. It may be used in conjunction with *passiflora* in full doses to the limit of its physiologic influence as the patient can endure it.

Chloral and the bromids exercise a soothing influence upon the patient and in part control the spasms. One physician opened the infected wound widely and filled it with a dram of powdered chloral, and with the internal administration of the remedy he claimed to have controlled the disease satisfactorily. Chloroform inhalations are advisable in extreme pain and spasm. The remedy exercises no curative influence. The Bacelli method of

carbolic acid injections has been used by Stevenson and others in tetanus with good results. Three cases treated by Stevenson in this manner all recovered. The wound was opened freely and the agent was injected into all the tissues. A two per cent solution of carbolic acid was used hypodermically in twenty minim doses, every two or three hours. This dose may be increased until by the third day twice or even three times the above amount is used. When the tetanic symptoms abate the dose can be slowly reduced. The system is remarkably tolerant of carbolic acid in this disease. **Morphin** may be used as needed and chloroform inhalations may be administered during the continuance of this remedy with better results than either alone.

We have excellent reports from the use of **echinacea** in tetanus. There is a record of nearly forty cases in which, with the usual preliminary treatment, this agent was given in from one-half to one dram doses every two hours. It was also injected into the tissues surrounding the infected wound, and the wound was dressed with gauze saturated with the remedy. I feel confident that future observation will prove it to be superior to any other remedy for internal use.

The use of a **tetanus antitoxin** is now authorized. Of 96 cases treated with Behring's serum, after symptoms of the disease had appeared, there was a mortality of thirty-eight per cent only. Other and more extended reports give a mortality of from forty to forty-two per cent. In cases where the disease was anticipated and the remedy administered as a prophylactic measure the results were more satisfactory. In especially severe cases it is advised that the antitoxin be injected directly into the spinal canal, having previously withdrawn an equal quantity of the fluid. To us this seems an unjustifiably severe and dangerous procedure, with so little testimony as yet in favor of a curative result.

ANTHRAX.

Synonyms:—Charbon; malignant pustule; carbuncle; splenic fever. These synonyms are apt to be confusing, as they confound this disease with better known diseases of the same name, not caused by this bacillus.

Definition:—A disease usually affecting herbivorous animals primarily, and conveyed from them directly to omnivorous animals or to man. It is very seldom conveyed by direct infection from man to man. It is caused by a specific bacillus, the bacillus anthracis.

Etiology:—This is a not uncommon infectious disease in animals; at one time it affected entire herds, but now it is early diagnosed, and it is stamped out by destroying the first infected animals. From animals the disease is not readily conveyed to man, but in the handling of hides and in working in wool infection is directly acquired. The micro-organism may be inhaled or taken in with the food and drink, in which cases there are acute constitutional phenomena. The entire group of symptoms constitutes wool sorters' disease. More commonly the infection takes place through abrasions of the skin of the face, neck, arms and hands, from contact with the infected wool or hides, and a local inflammation is the first result, followed after a few days by a general constitutional infection.

Constitutional infection has occurred from eating meat from diseased animals. In a number of cases epidemics have originated from this cause. Infection of a number of individuals from drinking water from a well that had been contaminated has been known to result.

Symptomatology:—The form known as wool sorters' disease is very uncommon. The symptoms appear suddenly after an indefinite period of incubation. Usually there is a general sense of distress and **malaise** for a short time, quickly culminating in a severe **chill**. Occurring almost simultaneously with the chill is a **high fever** and

marked **pain in the stomach**, with rapidly increasing **dyspnoea**, which is usually easily diagnosed as other than cardiac dyspnoea. In severe cases the disease runs its entire course, and death occurs within a few hours after the first acute symptoms appear.

With dyspnoea there may be cough, labored respiration, cyanosis, rapid, irregular, feeble pulse, great prostration, collapse and death.

If the pain occurs first in the stomach or intestinal canal, developing the condition known as **intestinal mycosis**, sudden prostration, with nausea and vomiting, and choleraic diarrhea may be the first symptoms. The temperature falls, the pulse becomes feeble, evidences of rapidly failing heart action occur, and death quickly follows, usually within two, three or four days. Nervous symptoms, as **convulsions**, coma, various forms of delirium, may result in the severe cases, but death may occur with no mental derangement whatever.

When the infection occurs through the skin, **external anthrax**, or the condition known as **malignant pustule** results. At the point of infection, which is usually where there is a small scratch or wound, the skin being abraded or broken, a small papule first appears. This itches and burns and soon becomes angry and inflamed, with a red base. This increases in size, assumes the form of a vesicle and is filled with serum and blood. When the contents discharge a scab forms, bluish or black in color, which is characteristic of anthrax. Around the base of this primary vesicle a number of minute miliary vesicles now quickly develop, from which infection and acute local inflammation rapidly spreads. The tissues involved in this inflammation become dark colored after the vesicles discharge and sloughing occurs. There is no severe pain, and the itching and burning disappears with the discharge of the contents of the vesicle.

With the development of the local symptoms, **fever**, **chill**, **languor**, **headache**, **nausea** and other constitutional

symptoms appear in varying degrees of severity. Symptoms of **glandular infection** quickly follow, often in the course of the lymphatics, with swelling and severe local inflammation. Other constitutional phenomena, as enlargement of the spleen, great prostration, **prostatic sweats** and **diarrhea**, may follow.

Edema occurs in a number of cases of anthrax at the seat of or contiguous to the local infection. It is malignant and virulent in character frequently and occurs without the eschar developing from the papule. The œdema and swelling develop and increase so rapidly in the tissues of the face, head, tongue and lips, and perhaps the neck, that the circulation is impaired and a slough is formed or **gangrene** results. Death has followed quickly in nearly all of these cases.

Diagnosis:—When the patient's occupation is not taken into consideration the diagnosis of this disease from the symptoms is exceedingly difficult. The occupation, the occurrence of associated cases and familiarity with its development are essential to its quick recognition. The conclusions must be confirmed by an examination of the pustule contents, or by the inoculation of a guinea pig. The germ will develop rapidly in the tissue of the animal and can be soon found. Death follows the inoculation in two or three days.

Diagnosis of the internal disorder is made by exclusion, by the rapid course of the disease and by the profound constitutional involvement, and finally by the presence of the micro-organism in the blood.

Prognosis:—In proportion to the severity of the original infection and the rapidity of the invasion is the danger of this disease in its external forms. Internal infection causes death in nearly all cases. One writer, Bell, claims that patients who live six days will probably recover. Those developing from pustule, if of excellent previous health, can throw off the disease. Those having poor vitality, or possessing a constitutional dyscrasia, are apt to suc-

cumb. The local treatment, if prompt and heroic, is productive of much good.

Treatment:—Extreme antiseptic measures must be adopted from the first. If the papule is recognized before the pustule develops the tissue at the base should be injected with a safe solution of **carbolic acid** and a wet carbolic acid dressing, covered with a rubber protective, should be applied and re-applied every twelve hours. Excision of the pustule may be practiced in many cases, and antiseptic dressings applied to the raw surface of the wound. We would have great confidence in the injection of **echinacea** into the surrounding tissues, and in its internal use in the carbuncular form or when gangrene is threatened, as it has not yet failed to antidote the most virulent organic infection to a greater or less degree and to stimulate the stagnating capillary circulation. It will be of great value from the first to antagonize the constitutional infection. It should be given in dram doses every two hours in every case, without regard to the mode of infection. Other of our specific remedies will facilitate the action of this. **Phytolacca** will be servicable where the glands are involved, and **rhus tox** will have its specific indications in some cases. **Iodine** in some quickly appropriable form will help in general restoration. Organic iodine—the **Iodo-nucleoid**—will be of great service. **Iron** is important in anæmia, and to assist echinacea in antagonizing the formation of pus. In convalescence, echinacea should be continued, and the best of blood restoratives and nerve tonics should be given, with forced concentrated nutrition.

In individuals working among hides and wool, the use of a mild, harmless antiseptic solution, as a wash to the exposed parts, is advisable always. When the skin is abraded it should be treated antiseptically; and if of the fingers, it should be covered at once with a new rubber finger stall over a light gauze dressing. When handling dry wool or hides the mouth and throat should be washed and gargled with a similar solution and precautions taken

to breathe the least possible amount of the dust. Fresh air should be continually circulated in the room by means of fans and ventilators.

GLANDERS.

Synonym:—Farcy.

Definition:—A disease primarily developed in the horse, conveyed thence to man; due to the presence of the bacillus mallei. It is characterized by the presence of nodular masses at the seat of infection. It is called glanders when it develops in the mucous membranes of the nasal passages. Ulcers appear at the seat of infection. When it affects the skin the nodular tumors break down and abscesses form.

Etiology:—The disease in man is contracted by direct infection from contact with an animal suffering from the disease. The infection from the secretions of the animal will develop more readily upon the skin of the man than in the nasal passages. The disease occurs almost exclusively among men who handle horses. No cases among women are reported.

Symptomatology:—The disease develops in an acute form, but may subsequently become chronic. Within five days after exposure the patient complains of **malaise**, general distress, some weakness and **fever**. There is seldom any chill. At the point of infection there are **swelling** and other signs of local inflammation, which soon appear in the **lymphatic glands** and follow the course of the vessels. Small granular masses are found along the course of the lymphatic vessels, which become hardened and painful, and ultimately break down and slough. The **local abscesses** assume the form of boils often, although specific in their character. The development of pus in these sloughs results often in **acute pyemia**.

When the disease develops in the nasal passages there is a very free discharge of masses of purulent mucus, which may be streaked with blood. **Epistaxis** is common from the ulcers, which quickly develop. The nose and face swell and an eruption appears on the face, neck and chest. This eruption is at first papular. The papules, which first appear, develop into pustules and discharge, and a dry crust is formed, while other papules are yet developing. The mucous membranes of the entire head become involved and sometimes those of the bronchial tubes, esophagus and the gastro-intestinal tract.

As the ulcers deepen they may involve the periosteum and the structure of contiguous bones. Inflammation of the synovial membranes is common, with the development of a true arthritis. The joints become swollen, tender and painful, and the characteristic pustules are apt to form in the skin around them.

The course of the disease in an acute manifestation is very rapid. The patient becomes greatly prostrated and delirium may occur, although the fever may not be excessively high. Death occurs usually at the end of the first week.

In the chronic form of the disease the development is less rapid. Constitutional symptoms at first are not so strongly marked, but there are evidences of general infection, with the appearance of abscesses, nodular growths or ulcers upon any portion of the body surface.

Prognosis:—The disease in either acute or chronic cases is almost invariably fatal. A much larger proportion of the chronic cases than of the acute form recover.

Treatment:—The disease is greatly modified by treatment. It is necessary that the infected tissues be subjected to the action of the most **active antiseptics**. The nasal passages should be thoroughly irrigated three or four times each day. All sloughing surfaces should be cauterized and abscesses should be opened freely and curetted. The most active alterative measures internally should

be adopted. The use of *echinacea*, alternated with the calcium sulphid or calcium iodid will be effective. There is no doubt that a dressing of *echinacea* in full strength to the abscesses and ulcers will be of service also. This remedy should be given in dram doses every two hours. Forced feeding with a concentrated nutritious diet is important. When prostration appears, stimulating tonics may be demanded, with specific measures for the support of the heart.

ACTINOMYCOSIS.

Synonyms:—Lumpy jaw; big jaw; wooden tongue.

Definition:—An infectious disease, chronic in character, supposed to originally develop in cattle and swine and from them conveyed to man. It is caused by the presence of the ray fungus, the *streptothrix actinomyces*.

Etiology:—The origin of the ray fungus is unknown, but there has long been a theory, which is not yet exploded, that it develops on the seeds, perhaps of certain grasses, primarily in much the same manner that ergot develops upon corn and rye. There is no proof that it has ever been conveyed directly from one animal to another, or from man to man, and the exact origin of the disease in the most of the cases observed in man cannot be determined.

It is supposed to occur from the eating of meat which is infected, and there are doubtless other sources of introduction. The fungus finds entrance to the tissue through an abrasion, or it will enter the jaw, where it usually develops first, through a carious tooth. It develops also in the lungs and in the stomach and intestinal canal.

Symptomatology:—The appearance of the disease in the tissues of the jaw, tongue, neck or throat is in the form of microscopic masses—minute tubercles—which develop into

small granules or nodules of a yellowish white color, containing caseous matter and ultimately pus. The intervening tissues thicken and enlarge with the growth of the nodules, forming a nodulated tumor, which is progressive in growth. Cavities ultimately form from suppuration in the different nodules, which become connected by sinuses. The disease develops in the lungs and bronchi, with cough and the usual signs of irritation and congestion, with some local hepatization. Emaciation, hectic fever and general prostration are present, and the expectoration of a purulent substance, in which the actinomyces are found.

Diagnosis:—The diagnosis depends specifically upon the presence of the micro-organism. However, to one at all experienced, the evidences, when the condition has developed, are unmistakable. There is but little difficulty in differentiating between this and necrosis and sarcoma of the jaw.

Treatment:—No internal remedial measures alone have yet produced satisfactory results. The removal of the diseased tissues by the knife is important, and the use of active antiseptics in the disinfection of the wounds. The injection of carbolic acid solution into the surrounding tissues is productive of good results.

The use of the **potassium iodid** to a full saturation of the system has produced good results. **Calcium sulphid** will also be of service. We have much faith in the action of our active vegetable alteratives in preserving the integrity of the vitality within the system and in sustaining the function of the organs of nutrition and appropriation.

When constitutional symptoms develop they should be met as indications suggest. The combating of these symptoms will retard the progress of the disease and will further the chances of ultimate recovery.

Diseases of the Respiratory Passages.

ACUTE RHINITIS.

Synonyms:—Acute nasal catarrh; acute coryza; cold in the head.

Definition:—An acute inflammation of the Schneiderian membrane, catarrhal in character, and accompanied with intense hyperemia. It may involve also the adjacent sinuses and include all the nasal passages.

Etiology:—The most common cause is exposure to damp and cold and abrupt atmospheric changes. While micro-organisms of various kinds may be found present, the real cause of the difficulty is the intense local congestion, caused by the locking up of the secretions of the body. Acute inflammation of these membranes may also be caused by the inhalation of irritating substances, and as the result of other acute disease. All the phenomena in an intensified form are present in la grippe.

Symptomatology:—The first indications are those present in a common "cold." There is **lassitude**, general **muscular aching**, with **chilliness**. There is an **elevated temperature**, although usually not above 101° F. There is at first a feeling of dryness and stuffiness in the head, with frequent **sneezing**. A severe **frontal headache** usually develops, rather abruptly. This is especially severe at the root of the nose, and across the forehead, through the orbits, and including the supraorbital structures. Breathing through the nose is obstructed, and later impossible. The catarrhal discharge is at first thin, watery and irritating. Later it becomes copious, very thick, yet clear.

In severe protracted cases it may contain pus. The swelling of the mucous membranes, which produces the occlusion, interferes with both taste and smell; the lachrymal ducts may be closed also, causing the tears to flow, or the eustachian tubes may be closed, resulting in more or less **temporary deafness**. Usually there is extreme aching in the thick muscles, especially those of the back and thighs. The skin is dry, and as the disease progresses, it becomes very hot. The pulse is frequent; there is **anorexia**, with much **thirst**; usually the urine is scanty and high colored. In protracted cases the **fever** may become intermittent, the secretion increases in purulency and becomes fetid and streaked with blood, or free epistaxis may occur. The secretion may be so irritating as to induce excoriation, ulceration, or herpes at the nasal orifices or on the upper lip. The bowels become constipated, the kidneys inactive and all secretions are diminished.

Complications:—Conjunctivitis, pharyngitis, laryngitis, bronchitis or middle ear inflammation, which sometimes progresses to mastoid disease, have followed an acute cold.

Diagnosis:—This depends upon the distressing head symptoms, with the free discharge, but the disease must be differentiated from epidemic la grippe, in which the constitutional symptoms are usually much more severe, and prostration, especially of the nervous system, is not uncommon. A violent and sudden middle-ear inflammation may be taken for nothing but an acute cold, and the real condition be thus overlooked and neglected.

Treatment:—Abortive measures are of great importance and may be successful in most cases. The patient should take a **hot foot bath**, should drink hot drinks in abundance, being thoroughly wrapped in flannel blankets and profuse perspiration should be induced at the onset of the disease. This may be accomplished by a dose of **diaphoretic powder**, by an infusion of **asclepias** or by hot lemonade. Twenty minims of **jaborandi** may often produce satisfactory results. Other remedies having a specific influence upon

this disease are **gelsemium**, **salicylate of sodium** and **tincture of iron**. Gelsemium should be given at the onset of the cold, a full dose of perhaps five minims may be repeated in half an hour. Subsequent doses of two minims of the specific medicine may be given every hour until the symptoms have abated. In many cases the action of the salicylate of sodium in this disease will be surprisingly prompt and satisfactory. Fifteen grains should be given to an adult, dissolved in an ounce of water. This may be repeated twice at two-hour intervals. This will produce marked relief, usually when the remedy may be given every two hours, in five grain doses, for perhaps one day longer. The tincture of iron is indicated in a limited number of cases where there has been feebleness and previous relaxation of the nasal passages. Ten minims in one-fourth of a glass of water, sweetened, may be given every two hours. When the symptoms are not aborted, the indications must be closely studied and carefully met with the proper remedy, the tincture of **aconite** and **specific bryonia** will often meet the demand for internal medication satisfactorily. In cases where the secretion is excessive **belladonna** will be found of service.

The tincture of **euphrasia**, half a dram in four ounces of water, may be given in teaspoonful doses every hour, where the discharge is thin and watery and where there is considerable lachrymation. This remedy is especially valuable with children, and in the condition known as **snuffles** in very young infants. Salicylate of sodium may be used for this condition also, by giving frequent dram doses of a solution of five grains in two ounces of water. The inhalation of **camphor** is valuable in the treatment of an acute cold. The inhalation of the vapor of boiling water, or steam charged with the vapor of **eucalyptus**, or the compound tincture of **benzoin**. Or a douche may be used which contains **listerine** or **menthol** and soda.

The patient should use care to avoid exposure to cold or draught for several days following an attack of this dis-

order, as there is an increased susceptibility to cold, which may induce acute inflammation of a serious character in some other organ of the body.

CHRONIC RHINITIS.

Synonyms:—Catarrh; chronic nasal catarrh; ozæna.

Definition:—A chronic inflammation of the post-nasal mucous membrane, persistent in character and intractable to the usual remedial measures, while the atmospheric conditions continue, which induce it. These are usually damp atmosphere, with abrupt changes in the temperature.

Etiology:—Frequent attacks of acute coryza will result in this disease. The atmospheric conditions above referred to are the commonest causes. The continued inhalation of damp air, which contains dust or other irritating substances, or the presence of constitutional dyscrasia. Foreign bodies which have been introduced into the passages and not discovered, or a foreign growth, as a polypus, or a deflection of the septum nasi, all act as inducing causes.

Symptomatology:—The disease may occur with hypertrophy of the mucous membrane, with a persistent discharge, or there may be atrophy of the mucous membrane, with extreme dryness.

In the hypertrophic form there is marked **thickening** of the **mucous membranes**, with **hypertrophy** of the **turbinated bodies**, resulting in engorgement and a thick mucus discharge. When ulceration occurs, in protracted cases, the discharge becomes purulent and fetid (ozæna). There is impairment of the sense of smell and often of hearing also, and the patient may be obliged to breathe through the mouth entirely, or through one nostril at a time; the **nasal obstruction** may be influenced somewhat by gravitation, the patient awakening in the night, lying on the right side, will find that he can breathe only through

the left nostril. After turning over and lying on the left side for awhile the left nostril becomes occluded and the right nostril is freely open.

In the atrophic form of this disease the passages feel dry and often stiff and sore. An examination shows that the passages are dilated or widely open; there is some discharge, but this usually dries at once, forming a crust, with an odor which is extremely offensive. The sense of smell may be entirely lost, the membranes are usually pale and sometimes on inspection appear dry and glistening.

Diagnosis:—The disease is not likely to be mistaken for any other chronic condition. An examination of the post-nasal passages will quickly determine the presence of those factors which are characteristic of this disorder if the usual manifestations are obscure.

Treatment:—Much is accomplished in the relief of this disease by the use of appropriate measures, but a cure is almost impossible in those localities where the atmosphere is constantly moist and the temperature is liable to abrupt and sudden changes. If a cure is accomplished a relapse will occur with but little provocation. The patient becomes liable to relapses in cases that are at all prolonged in character.

In the hypertrophic form of the disease, if there is an excessive mucus discharge, the internal use of five minims of **turpentine** on a lump of loaf sugar, four times daily, will be of much service. In cases where there is persistent sneezing, with a constant inclination to blow the nose, and a profuse watery discharge, five drops of **euphrasia** every two hours will give relief. **Dulcamara** will benefit many cases, especially those that are dry in character. These are relieved also with two minims of **jaborandi** every two or three hours. The extreme dryness and atrophy may be greatly benefited with this remedy. Chronic thickening, affecting the senses of hearing and smell, is benefited by the use of **salicylate of sodium** in five-grain doses. Where the thickening and hypertrophy

becomes suddenly aggravated and extreme, especially if there be constitutional dyscrasias present, **calcium sulphid**, to full saturation, may be given. When the membrane is dry, with constant irritation, especially if the condition has extended to the bronchial tubes, with a dry, irritating cough, from two to five grains of **ammonium chlorid** may be given in solution every three hours.

In the hypertrophic form, especially where there is an excessive discharge, **camphoric acid** may be given in five grain doses four or five times each day. A one per cent solution of the acid may be used as a douche at the same time. Or, if the nasal passages are dry and irritable, the normal salt solution may be applied as a douche, it may be used very warm when there is much hypertrophy.

The condition of the general system should always be looked into. I am confident that the presence of an excessive quantity of uric acid in the fluids of the body has much to do with the presence of nasal catarrh, and this condition in the system—**lithemia**—should have careful attention. The avoidance of nitrogenous food is sometimes beneficial.

AUTUMNAL CATARRH.

Synonyms:—Hay fever; hay asthma; rose cold; periodical rhinitis; rag-weed fever; pollen catarrh.

Definition:—An acute asthmatic disorder, occurring about the same time each year and characterized by a catarrhal inflammation of the post-nasal and respiratory passages, with extreme hyperesthesia of the mucous membranes.

Etiology:—The disease depends upon a peculiar susceptibility of the patient to the irritating influence of the pollen of certain autumn flowers. This susceptibility is hereditarily transmitted in some cases. This nasal hyperesthesia may be “selective”—influenced by the pollen of

a single plant and not apparent at any time from other influences. In other cases the hyperesthesia is influenced by a great variety of irritating substances. It may be induced by an abnormal condition of the nasal passages or by the presence of tumors or by a deflected septum. It is more common among the so-called "upper classes," is entirely absent in the mountainous regions and in the northern lake regions of the United States, and on the sea. It is not readily acquired by people living in the rural districts, but is especially liable to occur among sensitive people, who have long inhaled the dust and irritating atmosphere of the city streets. It occurs in the male sex more often than in the female, and in young adults, rather than in the aged. Children are seldom affected by it.

Symptomatology:—As stated, the occurrence of the disease is usually anticipated by the patient, as due at a certain given time, and usually the patient is not disappointed. Up to that time he may be in perfect health, when, with no premonitory symptoms, there is a pronounced **cold in the head**, with the accompanying **sneezing**, **obstruction of the nasal passages**, discharge of a **thin watery mucous**, with increased redness of the mucous membrane of the nares, and marked **redness of the eyes**, with free **lachrymation** and itching of the lids. This sometimes develops slowly, but usually it reaches an extreme point, within forty-eight hours. The nasal discharge irritates the nares and the upper lip, and there is constant blowing of the nose and **sneezing**. The asthmatic symptoms may be so slight as not to be spoken of. In other cases, the irritation develops first in the bronchial passages, with extreme asthmatic breathing and bronchial irritation.

Fulness of the head, and supra-orbital or frontal headache, are very common. There is **tinnitus**, **deafness** and loss of the sense of smell and taste. The patient becomes **listless**, and there is **lassitude**, **despondency**, and some **debility**. There may be some exacerbations, in the course of

the disease, depending largely upon the exposure of the patient or upon the conditions of the weather. **Feverishness** and **chills** are not uncommon, with loss of appetite and disturbed sleep. The symptoms usually abate with the first appearance of frost and the following steady cool weather is often a great relief to the patient. As the condition does not usually appear until late in the summer, or in the early fall, the course is thus limited to from six to eight weeks. However, the local irritation sometimes induces a condition of **reflex asthma**, or **asthmatic bronchitis**, which remains after the specific disease has abated.

It is not impossible for idiopathic cases, depending upon other causes of irritation, to occur at any time during the year.

Diagnosis:—A patient who has suffered from a disease at a given period, will look for its return, at same period, the next year. It often returns with surprising regularity and promptness. The sudden onset of severe nasal symptoms, strikingly similar to those of an acute cold, with the watery nasal discharge and usually asthmatic breathing, the patient having been previously in good health, readily determine the character of the disease.

Treatment:—As yet no specific cure for this disease has been found. Homeopathic physicians in compliance with their law of similars, have used **rag-weed** in the treatment, and they claim with good results; quite a number have used an infusion of rag-weed internally and externally, and claim an amelioration of the symptoms. Dr. Horman, of Chicago, uses an infusion of the **smart weed** and claims invariable benefit. It is used principally as a douche. He has observed many hundred cases and claims that a very small percentage, only, fail to get marked benefit from the first. With this agent the susceptibility is reduced and subsequent attacks are much lighter.

Patients who anticipate an attack of this disorder should place themselves in the hands of a physician, for

the removal of any rheumatic or gouty conditions that may be present, and that the condition of the stomach, liver, intestinal canal and excretory and secretory organs may be put in the best possible condition, the excretion of an excess of uric acid must be corrected and normal secretion must be insured. If this condition has not been overcome the patient should take about a dram of the **phosphate of sodium** in a cup of hot water before meals, until a slight laxative effect is obtained, then the quantity may be reduced to thirty or forty grains three times a day.

With the first appearance of the disease, the patient should receive the following mixture: **Gelsemium**, one dram; **euphrasia**, two drams; **macrotys**, twenty minims; **lobelia**, ten minims; **syrup of tolu**, q. s. to make four ounces. Of this a teaspoonful should be given every two hours.

As in acute coryza fifteen grains of the **sodium salicylate** should be given at the onset of the attack and repeated twice with intervals of two hours, subsequently, five grains may be given regularly every three hours with good results. When the watery discharge is extreme the use of **belladonna** to produce its physiological influence will be found valuable. In some cases better results are obtained by using **atropin** in doses of the one three hundredth of a grain, hypodermically, every three or four hours. Thorough irrigation of the nasal passages with a solution of the **peroxide of hydrogen** in water, or in the normal salt solution, one part of the peroxide to eight or ten of the fluid, will be very beneficial. The internal use of **sticta pulmonaria** is advised as serviceable in the treatment of this disease.

Rhinologists are using solutions of **cocaine** and of **adrenalin chlorid** as irrigating fluids with good results in some cases. There are objections to the use of either of these remedies which must always be considered.

EPISTAXIS.

Synonym:—Nose-bleed.

Definition:—A condition of hemorrhage from the nasal passages, depending usually upon local causes.

Etiology:—A direct injury to the mucous membrane is the most common cause. Congestion of this membrane, with the formation of ulcers, is another common cause. The presence of polypi and other foreign bodies will induce it, and it occurs in infectious fevers, especially in exanthematous disease. It is especially liable to occur when any acute or chronic disease affects the fibrin and thus the coagulating power of the blood. It occurs in any disease in which there is a liability to sudden cerebral congestion, which is known among the laity as a “rush of blood to the head,” in diseases of the heart and especially in vicarious menstruation. Severe over exertion results in nose-bleed in some plethoric patients, and children may be liable to its frequent and sudden occurrence in a severe form, with no explainable cause. With these cases there is probably a tendency to hæmophilia, with some hereditary weakness and perhaps a tendency toward anemia.

Treatment:—The treatment of a case that has suddenly appeared, where there is no previous habit, should be based upon the supposition that it is due to a traumatism. If the patient is made to sit up and pressure is applied with the thumbs on the border of the inferior maxilla over the facial artery, a simple hemorrhage may be stopped. The application of cold to the back of the neck is sometimes beneficial. Continuous pressure applied against the upper lip, pressing it against the upper teeth, will control some mild cases. I have had excellent results in recurring cases with the use of from fifteen to thirty minim doses of the **compound tincture of erigeron and cinnamon**, made by dissolving one dram each of the oils of erigeron and cinnamon in two ounces of alcohol, this is given internally in a tablespoonful of water

every ten minutes. One physician occluded the nasal passages by drawing into them a strip of salt pork; they may be plugged with cotton saturated with a mild astringent solution, or a spray of a mild solution of the **persulphate of iron** or of the **adrenalin chlorid** are sometimes of temporary benefit. In cases where there is a sudden rush of blood to the head, the patient should have an immediate **hot mustard foot bath**, from twenty to forty minims of **ergot internally**, and cold applications to the head, and should be kept in a sitting posture, if possible.

ACUTE CATARRHAL LARYNGITIS.

Synonyms:—Catarrhal laryngitis; acute endolaryngitis; pseudo-croup.

Definition:—An acute inflammation of the mucous lining of the larynx, accompanied with loss of voice, hoarseness, cough and painful deglutition, with a sense of constriction in the throat and respiratory passages.

Etiology:—While this disease may occur primarily, it is more apt to follow an attack of coryza, or an inflammation of the post-nasal passages, which occurs from exposure and atmospheric changes, or from the result of the inhalation of irritating gases, or impure air; also from the presence of foreign bodies in the larynx, from local injury, or traumatism and from over use of the voice. It also occurs as the result of constitutional infection at times, especially in those who are of a weak constitution. It may result from the cigarette habit, from the smoking of strong tobacco, and from the use of alcoholic drinks. Any irritating substance which will induce hyperemia of the mucous membranes will conduce to its occurrence. It is not uncommon with children who persistently breathe through the mouth. It occurs from diphtheritic infection more often than is supposed.

Symptomatology:—An early indication is pain in the throat. This may be preceded for a few hours by a slight chilliness, and if the temperature be taken, it will be found to register one and a half or two degrees above normal. Occasionally, however, there is slight malaise with indisposition to exertion. The disease being quite insidious in its development. In yet another class of cases there is a sudden rise of the temperature with every evidence of local inflammation and marked hoarseness or complete aphonia. With this, there is dry skin, flushed face, frequent and hard pulse, with considerable embarrassment of the respiration. In a few cases there is edema of the larynx, which results in extreme dyspnea. The dryness of the mucous membranes is a partial cause for the sensation of tickling in the throat to which the cough is attributed. The cough is at first dry, harsh and somewhat spasmodic in character. Later as the disease progresses there is considerable expectoration, the cough becoming correspondingly looser, but this does not relieve the difficulty in swallowing which persists, sometimes becoming extremely severe. If complete aphonia be not present the voice may be very hoarse and the hoarseness persists and is often intractable to treatment. There is a characteristic soreness of the throat which in many cases amounts to excruciating pain, sometimes producing spasms if irritated to any extent. An examination of the throat upon inspection under a strong light will show the whole larynx to be red, profoundly congested, and a considerable tendency to edema.

The membranes are swollen and tumefied and there is some swelling and redness also both of the epiglottis and of the trachea. As secretion is established the membrane is covered with mucus.

Diagnosis:—The characteristic phenomena of this disease are the extreme hoarseness or aphonia with the extreme sensitiveness of the throat amounting to pain. In laryngismus stridulus there is an absence of fever. In mem-

branous laryngitis there is the membranous exudate which induces the peculiar difficult breathing, which differs materially from that of acute catarrhal laryngitis.

Prognosis:—It is seldom that serious results occur from this condition as it is amenable to treatment, and quite easily managed. The prognosis therefore can be said to be good in favorable cases. If there is edema the case becomes comparatively serious, and prognosis in childhood is by no means as good as in adult cases.

Treatment:—In the treatment of these cases the patient should be **put to bed** in a room in which **the atmosphere** is kept persistently charged with watery vapor. Measures should be adopted also, by means of which the patient will inhale steam freely, two or three times within the twenty-four hours. The steam may be charged with acetic acid vapor, menthol, eucalyptus or the tincture of benzoin. An application should be made to **the throat** of **libradol** or some other plastic dressing and heat applied for six or eight hours. Afterward, if the condition is not relieved, hot, wet compresses should be applied for a short time. Cold applications should be avoided except, perhaps, in milder cases, but even in these heat will be of greater service. The throat should be protected subsequent to this treatment by warm, dry flannels until recovery is complete. The use of the hot mustard foot bath is of great efficacy in its derivative influence and in producing free perspiration. From the first inauguration of the treatment the patient should be protected from atmospheric conditions and changes in temperature. Drafts and extremely dry air must be studiously avoided, as well as an atmosphere charged with dust or any noxious or irritating substance.

The use of **aconite** and **collinsonia** at the onset with small doses of **belladonna** will be of much service. Later if secretion does not become established, belladonna may be discontinued and small doses of **jaborandi** should be used in its stead. These remedies may be continued for several days with highly beneficial results. **Collinsonia**

should be continued in perhaps ten minim doses every two or three hours. In some cases there is a rheumatic tendency strongly marked. In these **macrotys**, **potassium acetate** or **sodium salicylate** may be given freely with good results. **Nitric acid** has an immediate effect upon hoarseness. A drop or two of diluted acid may be dropped on a square of loaf sugar and held in the mouth until it has dissolved or from five to ten minims of the diluted acid may be taken internally every two hours, diluted in a sufficient quantity of water. Often at the onset of the disease this will relieve the hoarseness and embarrassment of breathing in a superior manner. In an occasional case there will be sharp, quick, cutting pains in the throat with the rheumatic symptoms which will indicate the use of **bryonia**, when this remedy should then be given. The use of medicated sprays or inhalations is of much service or the **chloretone inhalant**, **albolene**, or a simple **salt solution** with **boric acid** will be found serviceable during the course of the disease. For the hoarseness and cough **ipécac**, **lobelia**, **sanguinaria** and the **ammonium chlorid** will be found beneficial when prescribed in harmony with the exact indications.

CHRONIC CATARRHAL LARYNGITIS.

Synonyms:—Chronic endolaryngitis; simple chronic laryngitis; clergyman's sore throat.

Definition:—A chronic inflammation of the larynx, catarrhal in character, which involves its mucous structures, often quite persistent or stationary in character.

Etiology:—It occurs as an extension of an acute or sub-acute catarrhal inflammation of the post-nasal passages; also from persistent use of the voice, when there is weakness of the vocal structures. It occurs also, developing in an insidious and gradual manner, from any of the causes

that will induce the acute form of the disease. It is common with alcoholics.

Symptomatology:—One of the first symptoms is dryness of the larynx, which causes a constant effort at hawking, as if clearing the throat of a tenacious mucus. The voice is thick and harsh; in fact, hoarseness is a most common and persistent symptom. The voice tires easily, the patient being unable to do any prolonged speaking, and huskiness soon occurs, with sometimes complete aphonia. Ultimately there is a cough, which becomes persistent. Usually it is short, harsh and hacking in character, but at other times it occurs in a spasmodic form, in paroxysms, and seems to be caused by a tickling in the throat. Again, it assumes a barking, or deep, hoarse, ringing character, and becomes very annoying to the patient. Usually expectoration is scanty, the cough being quite dry; at other times there is an outpour of thick mucus, or there may be a slight quantity of a mucopurulent expectoration. The pain is by no means as severe as in an acute form, but it may be annoying and persistent, becoming aggravated by efforts at prolonged speaking or singing.

Inspection of the throat reveals a mucosa, which, while somewhat tumefied, lacks the extreme swollen and reddened appearance of the acute form of the disease. The mucous glands are distended, and the mucous membrane presents in some cases a slightly ulcerated or eroded appearance.

Prognosis:—The prospect of a complete recovery in these cases is not good. The development of the disease is usually slow. Slight chronic structural changes in the mucous membranes are apt to occur, which render the condition more or less permanent in its character. If the patient be removed entirely from the exciting causes, and change his occupation, giving the voice complete rest and encouraging improved physical development, the condition may be relieved in time so as to be almost entirely unnoticed, or to produce but little discomfort.

Treatment:—It is obligatory upon the patient, if he obtain any improvement in this condition, that he desist from smoking entirely, and from the use of alcoholics; that the voice have a complete rest and that he be removed from any persistent atmospheric condition which, from the presence of dust, irritating odors or vapors, would induce irritation of the mucous membranes of the throat. **Physical exercise** should be encouraged and a course of tonic treatment prescribed, which will improve every function of the muscular and nervous symptoms. The **sea air** and sea bathing have exercised very conspicuous beneficial results in many severe cases of this disorder.

There are but few specific measures that can be suggested in the medical treatment. We have depended upon the use of **collinsonia** in doses of from fifteen to thirty minims, every two or three hours, to relieve those cases in which there are no apparent structural changes, which will be found of benefit in all cases. Scudder classed it as a specific for this condition. We would be inclined to select other remedies which would meet other specific indications of the case with the expectation of inducing excellent results. The use of a spray of **albolene** or a **chloretone** inhalant, or other antiseptic, soothing, alkaline preparation, will be found of benefit. Where ulceration has occurred, the use of a saturated solution of boric acid, or a solution of potassium chlorate, will result beneficially.

SPASMODIC LARYNGITIS.

Synonyms:—Spasmodic croup; false croup; catarrhal croup; laryngismus stridulus.

Definition:—An acute spasmodic form of laryngeal inflammation limited to children usually under seven years of age. Characterized by a spasm of the larynx, difficult breathing and usually a very hoarse, barking cough.

Etiology:—The most common cause, in the author's experience, is the excessively dry air of furnace heated houses, which is especially provocative of the disease in the months of October and November, when the furnace fire is first lighted for the winter. The hot, dry air charged with a very fine dust, in close rooms will induce repeated attacks in the same child.

Other causes are those which induce acute laryngitis, especially sudden exposure to cold air. Where these causes are not conspicuous, patients suffering from impaired constitutions; especially those that have rachitis or adenitis or other evidence of a tubercular diathesis are especially liable to it. Children suffering from disease of the post-nasal structure whereby mouth breathing is induced are frequently attacked, atmospheric conditions being favorable. Nervous irritation is a common cause of this disorder in neurotic children.

Symptomatology:—A distinction must be made between spasmodic croup from laryngeal inflammation and the purely neurotic form of laryngeal spasm. In spasmodic croup proper the child awakes suddenly from a sound sleep, usually between ten and two o'clock in the night, and crying out from some apparent obstruction to the breathing, coughs two or three times with a loud, dry, ringing, croupy cough; an examination shows the child to have considerable fever, the difficult breathing increases there is a harsh, stridulous inspiration, the child showing anxiety and increasing restlessness. In mild cases the symptoms of distressed breathing may not last but a few

moments, the child falling asleep, to be awakened in perhaps half an hour with the symptoms greatly exaggerated, the breathing is now very difficult and distressing, the countenance becomes somewhat cyanotic and if not relieved, markedly so. Sometimes there is an abrupt termination of the laryngeal symptoms for a short time, the patient breathing quite naturally. The fever, however, continues. In the purely neurotic spasm there may be no fever or constitutional symptoms. There is a sudden oppression of breathing with the characteristic dry, resonant cough accompanied with a crowing inspiration, accomplished with great effort. There may be a complete intermission or general convulsions may occur. Considering the severity of the difficult breathing, there is but very little cough as compared with true spasmodic croup. In some cases the cough is entirely absent; this form may occur at any time during the twenty four hours.

In the inflammatory form the fever will continue during the night, even when the distressing symptoms abate, but will not be apparent in the morning, the child seeming quite well. If no attention is paid to the condition during the day the fever will recur in the evening and the distressing breathing will be more severe than on the previous night. Even with good treatment there is a tendency for the condition to recur on three or four consecutive nights.

Diagnosis:—The condition in either form is readily distinguished from membranous croup by the slowly increasing difficulty in breathing which characterizes that disease, and in which the development of this symptom is gradual throughout its entire course and without interruption.

Prognosis:—The prognosis is good, death seldom occurring from spasmodic croup.

Treatment:—The treatment of the inflammatory form is simple and effectual, the entire train of symptoms may be abated in some cases by the use of aconite alone. If

the fever is conspicuous, and the difficult breathing not yet severe, drop five drops of the tincture in four ounces of water and give half a teaspoonful every ten minutes until the skin becomes moist and the breathing easier, when a teaspoonful may be given every hour or two. If the difficult breathing is the conspicuous symptom give half of a teaspoonful of the **syrup of ipecac**. If vomiting is not induced this may be repeated in an hour if necessary. The application of **libradol** to the throat produces, perhaps, the most immediately satisfactory results of any treatment we have yet used. If applied during the spasm, it should be of full strength and removed with the first appearance of **nausea** at which time the difficult breathing will have abated. The throat should be thoroughly washed and an application made of the liniment of **stilingia** and covered with a dry, warm, flannel compress. In a number of the author's cases there has been no recurrence of the symptoms after this treatment. On the following day, however, the child should be kept in a moderately warm room, the air of which is kept moist, and should have a very light nutritious diet.

The purely nervous form of laryngeal spasm should be treated with hot applications to the throat, a general hot bath and the specific anti-spasmodics, such as **gelsemium**, **lobelia**, **ipecac** and **sanguinaria** or the **bromids** and **chloral**. In extreme neurotic spasm the inhalation of a whiff or two of **chloroform** will sometimes give immediate relief until other measures can be used.

It is quite common for the irritating causes of this disease to induce a general laryngitis or a clear case of bronchitis without intermission between the two conditions. In this case, the inflammatory symptoms increase, the croupal cough changes in character, becoming moist and losing its resonant note. The difficulty in breathing disappears, the temperature rises to perhaps 103° F. or perhaps 103.5° F. with a slight morning remission, and may continue for from one to two weeks. The treatment under

these circumstances should be distinctly that of the consecutive disease. The course suggested in acute laryngitis, to preserve a condition of continued moisture in the atmosphere during the entire course of either of these diseases, should be adopted and persisted in.

The patient should receive careful attention during convalescence. There should be no exposure to the cold or to draughts and the patient should be kept in a room in which the temperature is uniform. The administration of a tonic which contains small doses of **quinin** and iron will confer an immunity against a sudden recurrence of the disease.

ACUTE CATARRHAL BRONCHITIS.

Synonyms:—Acute bronchitis; bronchial catarrh.

Definition:—An acute inflammatory disorder, involving the mucous membranes lining the bronchial tubes and extending also in most cases to the mucous membrane of the trachea.

Etiology:—A common cause for this disease is exposure to cold, moist atmosphere. In the lake region of North America above forty-two degrees latitude, the disease is very prevalent, because of the abrupt changes of temperature, and the persistent moist atmosphere. It is most common in the spring and fall, but because of the sudden changes above referred to, which occur in this region in mid-summer, it is not uncommon at that season. It seldom occurs in the tropics and sub-tropics or where the atmosphere is persistently dry. All ages and conditions of life are subject to it, but it occurs more readily in those who are of feeble constitution or who are debilitated and in the aged and children.

The disease is also caused by the inhalation of various forms of dust and irritating vapors. It may follow as a

result of acute coryza, influenza and all of the exanthematous diseases and of protracted fevers. In childhood it is often an accompaniment of measles and of whooping cough. The condition known as cold in the chest, accompanied with an acute severe cough, is one form of catarrhal bronchitis. Bronchitis also follows acute spasmodic laryngitis, especially when that disease is induced by the inhalation of dry, dusty, furnace heated air. Robust individuals who live a strenuous life in the open air and are inured to the effects of cold are not likely to be attacked.

The mucous membrane of the bronchial tubes is especially sensitive to cold, congestion of the capillary circulation occurs readily on direct exposure. It is equally susceptible to the influence of heat and these facts may be proven by the direct application of heat or cold. It is also proven by the fact that this disease may occur suddenly upon exposure to extreme cold and may sometimes be completely aborted within a few hours by the persistent application of moist heat as intense as can be borne to the throat and upper portion of the chest.

The disease can not be attributed as yet to a micro-organism. Those which are found present are characteristic of pathologic conditions, which follow the primary inflammation. These are the various pyogenic staphylococci. If diphtheria has pre-existed, the Klebs-Loeffler bacillus will be found present; frequently the pneumococcus is present.

Symptomatology:—The onset of this disease is usually abrupt and presents the symptoms of an acute cold of a severe form, localized in the chest. At first there is chilliness with flashes of heat, general indisposition, malaise, slight sore throat, hoarseness and a harsh, dry, hacking, persistent cough. There is soreness and aching throughout the general muscular system, and often extreme soreness with a sensation of rawness beneath the sternum, accompanied with a hot, burning sensation which is con-

stantly increased by the coughing, with a sense of constriction and some **oppression of breathing**.

The cough, at first, is usually persistent, often occurring in incessantly repeated little short hacks. Later, as secretion increases, the cough changes in character, becoming moist and occurring in severe paroxysms.

While the **temperature** usually does not run above 102° F. for the first two or three days, in the severer cases it sometimes reaches 103.5° F. or 104° F. The **pulse** is not greatly accelerated and the respiration may not be more rapid than normal, unless there be an involvement of the bronchioles or of the lobules of the lung structure, in the latter stages of the disease. During the early stage of this disease there is but little **secretion**, but after perhaps three days, secretion becomes free, the discomfort, constriction and oppression in the chest become relieved, the soreness disappears and the cough which is now paroxysmal is not by any means as distressing as the primary persistent hacking cough. The cough may be increased upon lying down, or during the later stages of convalescence. It may occur when rising in the morning. At first the secretion is purely mucous in character, afterward becoming viscid or tough and tenacious and yellowish in color. In the later stages of a severe case it becomes distinctly light green in color, or of a greenish yellow hue and mucopurulent or purulent in character. As the expectoration becomes free the symptoms abate and often there is actual increase in the amount of the cough. The author has frequently noticed that the cough, which was distressing but restricted during the stage of dryness of the mucous membranes, was greatly increased as the patient improved, but devoid of harshness and irritating or distressing properties. At this time there is abatement of the constitutional symptoms; the temperature falls nearly to normal; the pulse becomes slower and full, and the respiration is regular and nearly or quite normal.

The disease under favorable circumstances may run its

entire course and terminate within five days, it is more likely, however, to continue from ten to twelve or fourteen days if not modified by treatment.

Physical Signs:—Percussion at first is normal, but as secretion becomes free the normal resonance in the infra-scapular spaces becomes diminished. Upon auscultation the respiratory murmur is feeble, sometimes disappearing entirely in local areas, at other times the respiratory murmur is harsh and distinctly audible. Over the entire chest sibilant and sonorous râles are distinctly heard. In the latter stage, as secretion becomes free, there are both large and small moist râles and ronchi, which may appear in one locality, to disappear shortly and reappear in another locality or to temporarily disappear entirely after a severe paroxysm of coughing.

Diagnosis:—The localization of the phenomena in the region of the large bronchial tubes with the physical signs just described will facilitate an immediate and unmistakable diagnosis.

It is not difficult to differentiate between these symptoms and those of pneumonia or of pleurisy with effusion, but it is somewhat difficult to diagnose early bronchial invasion in a case of whooping cough or to determine the involvement of the lung structure in broncho-pneumonia. The areas of consolidation determined by dulness on percussion, determine the presence of the latter named condition.

Prognosis:—In adult life and in previously healthy individuals, the prognosis is in every way favorable. The mortality is greatly increased in childhood and in old age. In cases caused by inhalation of dust and irritating vapors, the irritation having been prolonged over a length of time, the mortality is higher. The inclination for this disorder to involve the lung structure to a severe extent increases the severity of the disease and the resultant mortality. Those cases which occur as the sequelæ of infectious diseases are especially severe and difficult of cure.

Treatment:—The author feels that he is justified in stating that there is no severe acute inflammatory disease more amenable to treatment or more readily influenced by correct remedial measures, than acute bronchitis. If the treatment be begun early the disease will respond promptly and satisfactorily. For the general symptoms, appearing at the time of the invasion, which usually resemble those of an acute cold, the plan advised in the treatment of an acute coryza, may be carried out thoroughly in every detail, with the addition of the application of **pungent moist heat** to the chest, persistently, if necessary for twenty-four or thirty-six hours, until the primary capillary congestion has been entirely overcome, and until the distressing phenomena have all abated. This includes the inhalation of steam in a proper atmosphere as advised for spasmodic laryngitis. If the skin be dry and hot, with the developing fever, the secretions deficient, with dry bronchial cough, both **aconite** and **bryonia** are distinctly indicated. If congestive phenomena with persistent chilliness be present **belladonna** is given to excellent advantage, for the first day or two. For many years the author adopted a uniform course which was almost a routine practice with him, especially in children. In two ounces of water in one glass he would drop about five minims of the tincture of aconite, and eight minims of the tincture of belladonna, the quantity of each remedy varying a little with the age of the child. Into the same quantity of water in another glass, he would drop ten minims of bryonia and five minims of **ippecac**. These two mixtures were given alternately, in half teaspoonful doses; to children under six years of age, every half hour. The advantage of giving the smaller dose more frequently has been demonstrated in many cases. The result of this treatment during the first two days of the attack is sometimes phenomenal, the remedies directly antagonize the progress and development of those pathologic processes, which are immediately and essentially involved in the

development of the disease. Both aconite and bryonia restrain the temperature, antagonize the throwing out of exudates, encourage and promote their absorption when thrown out, prevent the breaking down of tissue, and the formation of pus. Belladonna antagonizes the determination of blood, or primary congestion, and facilitates an equalization of the circulation, quickly overcoming the tendency to chilliness; while ipecac has a positively reliable influence in soothing the irritability of the mucous membranes. The dosage of belladonna must not be sufficient to produce its characteristic physiological effect in retarding the secretion, and thus antagonizing this influence upon the part of the ipecac.

In those cases induced suddenly by the inhalation of dry, hot, dusty atmosphere, or other irritating vapors, usually accompanied with a hoarse, dry, barking or hacking cough, it is sometimes of great service to give preliminarily a full dose of one-half dram of the **syrup of ipecac**, or ten minims of this syrup may be given every two hours, until slight nausea occurs. This treatment is more applicable in older children, and in adults, than in infants. If the cough is persistently dry and harsh, a syrup may be improvised by combining ten minims of specific **lobelia** and ten minims of specific **sanguinaria** with two drams of dilute **acetic acid**, in three ounces **syrup of tolu**, or **syrup of wild cherry**, which is given in teaspoonful doses, every two hours. A most valuable stimulating expectorant which is well given in conjunction with bryonia, during the latter stages of the disease, is the **ammonium chlorid**, it need not be given in large doses—from two to four grains in syrup every two hours will be as efficacious as the larger dose.

The author has obtained excellent results where the dry irritating cough was unusually persistent, and where the secretions were dry, the mucous membranes of the mouth and tongue dry and red, by the use of **turpentine** in from two to five minim doses, dropped on a square of loaf

sugar. This should be very slowly dissolved on the tongue, the patient breathing, in long, steady inhalations, through the mouth and the saliva slowly swallowed. Turpentine is also specifically indicated in those cases of bronchitis which are characterized by an immense outpour of mucus, in which as one author states it, the patient is nearly drowned in his own secretions. It may be given as just advised or in the form of an emulsion.

Other available remedies which should be studied with reference to their specific application to the varying phases of bronchitis are **apomorphine**, **asclepias**, **dulcamara**, **hyoscyamus**, **phosphorus**, **jaborandi**, **sticta** and **thuja**. **Quinin** is to be given in bronchitis only as a restorative. It can be given in capsules in conjunction with powdered ipecac, to very good advantage, except during a period of excessive bronchial secretion. It should be given only after the temperature has abated and secretions are all free, the tongue moist and cleaning, and the appetite returning. The author has found no place for the continuous use of **opium** in the treatment of this disease. Combined with ipecac and powdered capsicum he has given one or two small doses of one-fourth of a grain of the powdered extract of opium, to temporarily allay a most incessant, irritating cough, until permanent action could be obtained from other specific remedies. In protracted cases of bronchitis, the treatment should be adjusted to the conditions in hand, with reference to the specific influence of each remedy; this is fully considered under the treatment of chronic bronchitis.

Summary:—If the disease is seen early, endeavor to abort it by restoring all excretion and by the application of heat to the chest.

Let the air of the room be very moist and the moisture persistently renewed. Use hot applications from the first, as long as the soreness continues, study every indication with great care in order to determine the exact specific remedy demanded.

Keep in mind constantly in the adjustment of the remedies, the underlying pathological factors and the necessity of correcting them.

CHRONIC CATARRHAL BRONCHITIS.

Synonyms:—Chronic bronchitis; chronic bronchial catarrh; winter cough.

Definition:—Chronic bronchitis is a chronic catarrhal inflammation of the mucous and submucous tissues of the bronchial tubes, differing from the acute form in its slow development, characterized by a persistent cough, which is subject to remissions and exacerbations and by ultimate structural change in occasional cases.

Etiology:—Primarily, the disease follows an acute attack of bronchitis, or it is the result of persistent or long continued exposure to unfavorable climatic conditions such as cold, damp weather and sudden atmospheric changes, or to continued working for a long period in a dust-laden atmosphere. Bronchitis in its chronic form is usually secondary to chronic constitutional disorders such as lithæmia, gout, rheumatism, syphilis or tuberculosis, or to chronic alcoholism. The form known as hypostatic bronchitis is a not uncommon complication of chronic interstitial nephritis, or of chronic valvular disease of the heart.

The primary form of the disease may occur at any time during early adult age, but the secondary form is much more common above middle life and during old age, it having persisted often for many years.

Symptomatology:—Persistent, intractable cough, varying greatly in different cases, is the commonest evidence of this disease. Usually there is **no fever**. Where the temperature runs persistently above normal, there are usually co-existing conditions upon which this is dependent. With

the cough there is persistent **bronchial secretion**, which may be mucoid in character, mucopurulent or in extreme cases purulent and fetid. Where the expectoration is free the cough occurs in paroxysms, but is not accompanied with any great discomfort. Where the expectoration is scanty the cough is more violent, there is a sense of soreness and constriction under the sternum, and the muscles of the upper abdominal walls become sore and lame from the violence of the cough.

The **cough** varies greatly with the season. In a large number of the cases it disappears entirely during the hot period of middle and late summer, while in the early fall and spring and during the winter months if there is much exposure the cough becomes exceedingly violent, and often incapacitates the patient for labor.

Each individual is apt to have a characteristic form of the cough which, in successive years, is alike. Thus if there is a dry, hoarse, ringing, metallic cough in one winter it is apt to assume the same form in the following winters. This fact is true also of the character of the expectoration.

The **pulse** is not influenced early in the disease unless there is a slight fever which may be present only in the night. The respiration is usually normal. except in aged patients.

When the cough is persistently dry or when but little expectoration is present with tenacious sputum difficult of expulsion, the condition is known as **dry bronchial catarrh**. When the cough exists with persistent asthmatic breathing, it is designated as **asthmatic bronchitis**. When the expectoration is profuse, and as it occasionally is, exceedingly offensive, the condition is designated as **fetid bronchitis**, although this condition may be one of **bronchiectasis** or it may be due to abscess or gangrene of the lungs, depending upon other chronic organic disease. In rare cases bronchitis exists in patients where those conditions are present which result in rheumatism or gout. There has

been much written concerning uric acid in great excess as a cause of bronchitis, asthma and catarrh. The etiological influence of this substance is not positively determined. When thought to depend upon these causes, it has been designated as **rheumatic bronchitis**.

There is a form of bronchitis in which the secretion is persistently abundant, usually not thick and tenacious, but watery and more like serum, of which it is largely constituted. From one to two quarts of this serum may be expectorated in twenty-four hours. This is designated as **bronchorrhœa**.

Diagnosis:—A difficulty in the diagnosis of chronic bronchitis is in determining whether or not it is the result of other chronic disease which may be overlooked in the treatment. The possibility of pulmonary tuberculosis must first be excluded. The kidneys must be carefully examined to determine that parenchymatous or interstitial nephritis are not present. Valvular heart disease must be excluded as well as all constitutional diatheses. It is also important to determine that the cough is not the result of reflex irritation, from the coexistence of chronic disease in the gastro-intestinal canal or in some remote organ. Uterine disease is not an uncommon cause of reflex cough.

Treatment:—But little benefit will result from treatment if the condition is secondary to other disease, which does not receive successful treatment as the primary cause. In uncomplicated cases the disorder is amenable to treatment and should be studied with special reference to the specific indication for direct medication. If there are evidences of chronic congestion of the mucous or sub-mucous tissues **belladonna** is a favorite remedy of the author's. It is especially useful where soreness with slight chilliness are present. If the cough is very dry, the dosage should be very small and frequently repeated; the physiological action of the remedy should not be observed in dilatation of the pupil nor in the drying up of secretion. If the secretions are excessive and expectoration is very

free, the agent should be given in larger doses for a short time to obtain its apparent physiological influence.

With this remedy **bryonia** acts in perfect harmony. It operates on the changes which have resulted or are taking place from the chronic inflammatory processes. It should be given, if the cough is very dry, especially if it be persistently short, sharp and hacking in character—not paroxysmal; also if with persistent soreness in the chest, there are short, quick, sharp, cutting pains, with a nocturnal rise of temperature. The author has combined these two remedies with the happiest results in many cases.

In cases of comparatively short duration the application of persistent heat to the chest is of much service. This may be best applied upon retiring at night and retained for two or three hours, when in an extremely chronic case it is sometimes beneficial to occasionally apply sharp external derivation, the use of the **thapsia plaster** is very serviceable. The eclectic “fathers” used the **compound tar plaster**. This is now considered unnecessarily severe as is also the **cantharides blister**. Good results are now obtained from the use of **turpentine** or other penetrating oils or from our compound **stillingia liniment**. Ordinary cough medicines are of little avail in this disease. The persistent use of the **ammonium chlorid** in small doses is of service where the cough is very dry. Where the expectoration is excessive or profuse **turpentine** is an important remedy. In the asthmatic form of the disease **grindelia robusta** with **yerba santa** may be given. Their use should be persisted in.

Verbascum thapsus will be found of much service also in this form. In winter cough which is persistently hoarse in character or which is deep, resonant, metallic or barking, without secretion, **lippia mexicana** has cured many cases for the writer without other medicine. It has proved almost specific. It may be given in from ten to twenty minim doses in **syrup of tolu** or **wild cherry**. Small doses of **lobelia** may be given in those cases where there is a

constant sense of constriction with but little secretion, or where the respiration is at all asthmatic in character. If spasmodic asthma occurs as a complication this remedy may be given in a single large full dose, of perhaps half a dram, to relieve the paroxysm. If the mucous membranes are dark red or purplish in character and show relaxation and atonicity **capsicum** may be added to the combination or it may be given alone, or with remedies indicated for other conditions, when these symptoms are present with the other conditions. When the expectoration is fetid in character **echinacea** or the **calcium sulphid** should be given with perhaps minute doses of turpentine or the oil of **eucalyptus** and these volatile antiseptics should be also administered by inhalation. **Creosote** will also ameliorate this condition, and should be administered in a proper menstruum. Other remedies which will be found of service are **thuja**, **drosera**, **sticta**, **piscidia** and **grindelia robusta**.

In the treatment of chronic bronchitis constitutional conditions must have direct and positive attention, and organic disease must be persistently treated. The nervous system must have attention. **Nerve tonics**, alteratives and general restoratives are usually indicated during the course of the disease. The stomach and digestive apparatus must not be overlooked, for while the appetite is usually good, digestion and appropriation are often faulty, and consequently the general nutrition of the system is imperfect.

BRONCHIAL ASTHMA.

Synonyms:—Spasmodic asthma; asthma.

Definition:—A condition of dyspnea depending upon contraction of the bronchial tubes and bronchioles. The term is applied to any chronic difficulty of breathing if accompanied with a wheezing respiration. Correctly speaking it does not include any form of difficult breathing, which does not have its cause in irritation and consequent contraction or constriction of the bronchial tubes.

Etiology:—Underlying all immediate causes is nervous hyperesthesia, inducing a predisposition to the disease. Most commonly the disease follows bronchitis in some one of its various manifestations. There is often present in asthma many of the pathologic factors of this disease. It is also due to chronic disease of the post-nasal mucous membrane, and is commonly induced by all those conditions named as the cause of chronic bronchitis, which may induce considerable irritability of the terminal filaments of the nerves distributed to the mucous membrane of the bronchial tubes. There is but little doubt that lithemia and rheumatic conditions in general are the cause of many cases. General nervous irritability, with or without evidences of neurasthenia, is present in a proportion of the cases.

It is estimated that nearly one-half of the cases of asthma, pure and simple, have a history of heredity. Some cases are dependent entirely upon the presence of chronic heart disease, with which the symptoms are intimately associated. Other cases arise evidently from irritation of the stomach, induced by the ingestion of certain kinds of food. At other times indigestion of any kind will induce an asthmatic paroxysm. The inhalation of dust and irritating vapors is a common inducing cause; certain individuals have an idiosyncrasy to irritation from certain substances only. This is so marked in some cases that while asthma is never present at any other time, it will be in-

duced by the presence of an exceedingly small quantity of the irritating substance in the atmosphere.

Symptomatology:—Spasmodic asthma occurs in abrupt paroxysms; usually there are no prodromal symptoms. The patient is awakened in the latter part of the night with suddenly **obstructed breathing**, so great as to cause the most intense alarm. **The face** assumes a characteristic expression; he is apt to spring from the bed and rush to an open window for air, believing that he is suffocating. All the respiratory and abdominal muscles are exercised in the effort to get breath; **the skin** is cool and is soon covered with a profuse cool perspiration; **the countenance** becomes livid or cyanosed, and the **extremities** cold. The inspiration, made with much effort, is comparatively short, while the expiration is greatly prolonged. If sitting up in the bed, the patient supports the thorax with the arms, the palms of the hands pressing upon the bed. **The temperature** falls, becoming sub-normal, and **the pulse**, at first slow, but large and soft, soon becomes feeble and quite rapid. The appearance is as if immediate dissolution threatened, but death never occurs in simple, uncomplicated cases.

When there is chronic heart disease, or dropsy, or protracted exhaustion from Bright's disease, the paroxysms may be serious. Unless artificial relaxation is induced, the spasm may continue for two or three hours. Toward the end of the paroxysm there is a short, harsh, irritating cough, with an effort as if to expel a tenacious mucus. Expectoration occurs finally, when all the symptoms abate. Soon the difficult breathing has disappeared entirely, but the patient will remain weak and exhausted for some hours.

In other cases there is at first the appearance of a very mild wheezing respiration, which may exist for perhaps twenty-four hours, but not sufficient to produce any great discomfort or to prevent sleep. Upon retiring the patient falls into a natural slumber, not at first disturbed by the

impaired respiration, which to an observer may be seen to be increasing in difficulty. The patient is finally awakened and while not complaining of extreme difficulty in breathing, will sit up in bed and remain awake the rest of the night. During the latter hours of the night the breathing will become greatly obstructed. Daylight will bring much relief, but there may be no entire absence of the difficult breathing for several days. Or successive nights may bring an increasing difficulty of breathing until the total symptoms are relieved by remedial measures. In extremely nervous cases the disease may occur as a pure neurosis, occurring usually after a day of unusual effort, exhaustion or anxiety, or perhaps after a violent fit of anger.

While there is no apparent organic disease, persistently recurring attacks, after a longer or shorter period, will induce chronic disease of the bronchial tubes, of the lungs or of the kidneys, or more commonly of the heart, which, in this case, may assume the form of hypertrophy, with more or less dilatation and valvular incompetency. The author attended a young lady in a paroxysm of asthma of an exceedingly exaggerated type, where the heart was so feeble that it seemed impossible that it should continue its action through the attack. The friends expressed no anxiety whatever, but insisted upon the immediate administration, hypodermically, of one-fourth grain of morphin. This was not given, but relief was obtained by other means. The friends claimed that there was absolutely no danger in giving morphin, as they had given it hundreds of times in previous attacks with best results. In a subsequent paroxysm the friends administered morphin themselves, hypodermically. Relief from the difficult breathing was immediately obtained, the patient fell into a quiet slumber and was left alone for a few minutes, when death occurred during the short absence of the attendant. Upon post-mortem examination the heart was found greatly

dilated, had ceased in diastole and contained an enormous clot of black blood.

Diagnosis:—Usually the history of previous attacks is sufficient to determine positively the identity of the disease.

The physical signs present are usually characteristic. There are peculiar musical rales, with greatly exaggerated bronchial breathing; these are apparent both upon inspiration and expiration, or to and fro rales are present, which are diffused throughout the structure of both lungs uniformly and are apt to change their position quite constantly. The disease may be differentiated from hay fever by the absence of the nasal symptoms, and by the appearance of that disease at a given time each year, although asthma, in one form, is an accompaniment of hay fever. It may be distinguished from inflammation of the larynx by the changes of the voice that are apt to be present in that disease, and while spasmodic laryngitis involves difficult breathing there is an absence of the characteristic wheezing of asthma. In spasmodic croup the difficulty is in the inspiration, while in asthma it is in the expiration.

Prognosis:—Uncomplicated cases do not prove fatal and are usually amenable to treatment, while complicated cases, however complicated, are serious in proportion to the character of the cause upon which they depend. It is sometimes exceedingly difficult to prevent the recurrence of paroxysms, but the paroxysm may be postponed by treatment and rendered mild and comparatively unimportant.

Treatment:—Relief of the excessive paroxysms, is the immediate demand for treatment. This being accomplished, attention is paid to the prevention of future attacks. Cases depending upon an acute attack of indigestion are relieved by the use of a thorough emetic for the purpose of evacuating the stomach and relieving both the local and reflex irritation. Cases depending upon intestinal irritation may be relieved by a thorough cleansing of the intestinal canal by a non-irritating physic. It may

be found advisable also to administer, subsequently, **santonin** in grain doses every two hours. This has recently been found to be an efficient remedy with which to relieve reflex irritation, which remains after the cause has been removed, or where the cause is difficult to determine. Antispasmodics are of service in cutting short the paroxysms. A single dose of specific **lobelia** will sometimes accomplish this result so immediately as to occasion surprise or alarm lest an overdose of a poisonous medicine had been given. The remedy should not be given often enough to produce violent emesis or depression, and must be avoided where serious disease of the heart complicates the case.

Sometimes the administration of a very small quantity of **chloroform** will temporarily relieve. It is better, however, to produce general relaxation. A full dose of the compound mixture of **lobelia** and **capsicum** is excellent in most cases; where there is simple nervous irritation, without prostration, **gelsemium** is a serviceable remedy.

In cases somewhat protracted in character, where the asthmatic breathing continues between the paroxysms, the author has obtained good results from the use of **grindelia robusta**. A single large dose of the syrup of **ippecac** will benefit those cases, complicated with bronchial irritation from acute or sub-acute inflammation of the bronchial tubes. **Glonoin** has been found of service in the violent paroxysm, and minute doses of **apomorphin** may be given where there is no danger of depressing the heart. In cases where the asthmatic breathing is uniform for a number of days, five drops of **veratrum**, three or four times a day, will be of much service. This remedy in smaller doses, of one minim every three or four hours, may be sometimes continued for a number of days with only good results. The inhalation of the fumes of **potassium nitrate** and **stramonium** leaves burned together gives relief so universally that their use has become common. A combination is prepared at drug stores for indiscriminate use. The in-

halation of tobacco smoke to those not accustomed to it, and the fumes from **lobelia**, **belladonna** and **hyoscyamus** are also beneficial.

BRONCHIECTASIS.

Synonym:—Dilatation of the bronchial tubes.

Definition:—A dilatation involving the structure of the bronchial tube, usually cylindrical or fusiform in character. The dilatation may be local or it may be universal.

Etiology:—It arises from coexistence of a chronic disease in the bronchial structure with a severe, long continued constitutional diathesis. It follows chronic bronchitis or phthisis more commonly than other conditions. It is immediately induced by violent paroxysms of cough.

Symptomatology:—The symptoms are usually those of the disease which has caused the condition. **Cough** is always present and is usually paroxysmal but the paroxysms are greatly prolonged, and produce much exhaustion and are accompanied with free, usually **profuse expectoration**. This is of a characteristic color—generally a dirty brownish tinge, muco purulent or positively purulent and emitting an offensive, sometimes disgusting stench. Upon standing, this expectoration separates into strata; there is a heavy sediment of thick mucus and pus cells. Above this is a thin, serum-like, fluid sero-mucus, and on the top of this fluid is a frothy substance of a brown color. This offensive discharge may also be mixed with blood in small quantity, or it may be accompanied with severe hemoptysis.

Prognosis:—The condition is not usually fatal but it is not amenable to treatment. Treatment of the underlying constitutional conditions will produce great relief.

Treatment:—The condition of fetor can be entirely relieved by internal antiseptic treatment. The underlying

congestion and local irritation can be benefited by the use of belladonna, ipecac or lobelia and bryonia. The iodid or the chlorid of ammonium are of some service in the treatment of this condition. In a general way, the same course should be adopted as is prescribed for chronic bronchitis.

Diseases of the Lungs.

BRONCHOPNEUMONIA.

Synonyms:—Capillary bronchitis; lobular pneumonia; catarrhal pneumonia.

Definition:—An acute inflammation of the terminal bronchioles and surrounding tissues, and with these the adjacent air vesicles of the lung structure. In involving the lung structure the disease includes areas of ultimate consolidation, which involves the lobules rather than the entire lobe, but which may be ultimately scattered throughout the lobes.

Correctly speaking the disease is either of primary or of secondary origin. It is primary when the inflammatory lesion originates in these structures, there having existed no previous illness. It is secondary when the disease is the result of inflammatory invasion which has been caused by a pre-existing lesion elsewhere.

Etiology:—The micro-organisms which are found present in this disease are the pneumococcus, when the disease is of primary origin; the streptococcus most frequently, when secondary; although the two named may be found together. When the disease follows influenza, the bacillus of Pfeiffer is found, and when following diphtheritic invasion, the Klebs-Loeffler bacillus.

The factors which predispose a patient to an attack of bronchopneumonia are prolonged exposure to cold, the inhalation of irritating substances, the use of the voice in the open air and bad sanitation. Among children this is the most common of the acute inflammatory lung diseases,

occurring most frequently as a primary invasion. It is that form of pneumonia to which new-born children are liable. The aged are especially liable to it also, but with these the secondary form is the most common. The disease occurs in children secondarily and closely associated with whooping cough, measles—a most common inducing cause—and scarlet fever. With these also, and with adults, it follows pneumonia, influenza, erysipelas, gouty conditions, typhoid fever and smallpox.

The disease is of frequent occurrence among those who suffer from protracted chronic and debilitating diseases, and with children who suffer from rachitis, inherited syphilis or tuberculosis. It is also a common accompaniment of pulmonary tuberculosis in adults.

Symptomatology:—In a primary case developing idiosyncratically there is cough, accompanied with **fever**. These may have been preceded by a **chill**, more or less severe in character, but usually not pronounced. It will be found that there has been exposure to cold, or the patient has worn insufficient or damp or wet clothing, or that he has been subjected to a sudden sharp change of the temperature. **The fever** is not as high as that of croupous pneumonia at first, but the temperature will ultimately reach 104.5° F. perhaps, and maintain this high point for some days. **The pulse** increases in rapidity until it may reach, with children, from 160 to 180 beats per minute. Ultimately it becomes small and feeble, easily compressible and irregular. The influence of this disease upon **the respiration** is characteristic. This may be said to be always difficult. It increases rapidly at the onset, especially in the secondary form, to from forty to sixty respirations per minute. **The cough**, which has been named as perhaps the first symptom, is severe and aggravating almost from its onset, but unlike that of acute bronchitis, it is seldom dry, but is usually accompanied with **expectoration**, which is not uniformly rusty colored, as in croupous pneumonia, but is streaked with blood, or contains minute par-

ticles of coagulated blood. The pain is not a conspicuous symptom. There is usually diffused soreness and little, sharp, quick, transient pains, which are apparent both with the inspiration and with the expiration.

In the primary form the disease terminates by resolution generally at the expiration of from ten to fourteen days. In the secondary form it is of slower development, often following acute catarrhal bronchitis. It may develop insidiously during the progress of some other disease, to which the attention is directed, and thus the invasion of the pneumonic complications is not discovered until the disease is well established. The increase in the temperature and the rapid breathing should direct the attention at once to pulmonary invasion. There is anorexia, nausea and occasionally vomiting, with usually constipation and rapidly increasing prostration. With children, like croupous pneumonia, the onset may be marked by the presence of pronounced cerebral symptoms. The patient is dull, stupid, is easily startled and has severe muscular twitchings. There may be mild delirium, with pronounced convulsions, and, as with the latter condition, the respiration may be very rapid; these phenomena may mask the pulmonary symptoms entirely.

In the aged the symptoms are by no means distinctly marked. There may be increased feebleness, but slight fever, with perhaps an entire absence of cough. The respiration, while rapid, is not as apt to be difficult as in childhood. The presence of the disease must be determined almost solely by the physical signs.

Upon physical examination it is only when the disease has become general, that fremitus is increased or that there is plainly apparent defective chest expansion, and dulness upon percussion is also present in the more advanced stages. Early in the case there are normal percussion sounds or they may be slightly tympanitic. There are at first sibilant and sub-crepitant rales as lobular consolidation occurs. These circumscribed areas can be readily de-

tected. With the rapid breathing the face becomes ultimately engorged and dusky colored, finally cyanotic; the lips blue and the countenance somewhat distorted.

Diagnosis:—It is sometimes almost impossible, especially in very young children, to discriminate between this disease and the phenomena of croupous pneumonia, but if the indications for treatment are rigidly adhered to no serious results may obtain by such a failure. The plainly apparent symptoms are the unusually rapid breathing, of sudden development, the characteristically very rapid and feeble pulse and the development of cyanosis with the increase in the temperature. This disease is more frequently secondary, while acute lobar pneumonia is nearly always primary, with a history of previous good health. Lobar pneumonia has the rusty colored sputum, general lobar consolidation and absence of bronchial symptoms. This form is usually bi-lateral, has a sputum that is streaked with blood, which may be tenacious and mucoid in character, with the bronchial symptoms conspicuous.

Prognosis:—In very small children and in the aged the prognosis is bad. Among young adults and in middle life the prognosis is good, and the mortality should not exceed five per cent, except in those where the disease follows a severe attack of other inflammation or where the patient is an alcoholic.

Treatment:—The conditions of environment, care and auxiliary treatment must be exactly the same as those of croupous pneumonia, to which we refer the reader. The necessity of maintaining a high degree of moisture in the room is, however, of more importance. To the vessel which contains the boiling water, a few drops of the oil of eucalyptus or of the oil of turpentine should be added once in six or eight hours. If possible, an open grate fire should be maintained or fire from a stove if the room is not steam or water heated. Furnace heat should be avoided. As with croupous pneumonia, the nutrition of the patient must have the closest attention from the very first, and nauseat-

ing expectorants or emetics must be avoided, as well as other agents which disturb the stomach, destroy the appetite or interfere with the digestion. As the disease is usually more diffuse in character than the croupous type, the entire chest should be enveloped from the first, for twenty-four hours at least, in a plastic dressing, and if soreness on respiration is present, this may be continued for three or four days, and external heat must be maintained. A cotton jacket should be applied over the plastic dressing and continued until the inflammation abates.

In severe primary cases, where the initial symptoms are pronounced and alarming, **libradol** is of immense value. It should be watched, however, and if applied strong to young children, should be removed before nausea is apparent—after from perhaps one to three hours—when it should be substituted by other plastic dressing. Later in the case the application of a turpentine stupe is of much service. As stated, **heat** must be constantly applied during the development of the disease.

Depressing measures of every kind must be studiously avoided, the physiological action of the special sedatives must be obtained only when no depression results therefrom. In giving **aconite** and **ipécac** the dosage must be small, and when so administered in accordance with their indications the influence will be satisfactory. The secondary influence of both remedies is thus exercised and only good results will accrue.

Veratrum should usually be avoided in children and in those at all feeble, and the aged. It will exercise a depressing influence in the line of its physiological activities if given in sufficient dosage, similar to that of the coaltar antipyretics, which are always contra-indicated because of the disintegration of the blood corpuscles which they induce. If used at all **veratrum** should be given only in sthenic cases and especially where there is much nervous excitement or convulsions.

Bryonia is most frequently indicated of any of the spe-

cific remedies. If a mixture of ten drops of the specific medicine in four ounces of water be given in half-dram doses every half hour there is absolutely no depression, and yet the temperature, pulse and respiration are controlled as well as the pain. The action of this medicine in small doses is exceedingly rational and is in every way consistent with a correct antagonism of the exact pathological processes.

Belladonna exercises a primary stimulating influence upon the capillary circulation, which antagonizes the local hyperemia, and subsequently the hepatization. It prevents an excessive outpour of secretion, which is apt to occur, and thus anticipates the possibility of the asthmatic form of respiration which may occur. It prevents difficult breathing from other causes also, and cyanosis, maintaining a uniform circulation in the capillaries of the entire system, and assists aconite in the diffusion and dissipation of heat.

Lobelia has been advised, and is often used indiscriminately. We would recommend it only in its secondary action, ten drops of the tincture of the seeds in a four-ounce mixture, in half-dram doses, is sufficiently active. This avoids any depressing or nauseating effect, and the results are harmonious with those of belladonna upon the local congestion. Administered in this manner it is very soothing in its influence upon the entire respiratory tract.

With the **phosphate of iron**, thoroughly triturated, the author has sometimes controlled the high fever of this class of diseases, all other remedies being excluded. The remedy should be given in solution, in hot water, for a period of from two to four hours at a time, every ten or fifteen minutes during the period of excessively high temperature. It will certainly surprise those who have not used it and is sometimes much more satisfactory than some better known remedies.

The author has had but little experience in the use of **sanguinaria** in this disease. If administered, it must be in small doses, and for its primary stimulating influence upon

the respiratory structures. No nausea or irritation must be induced by it.

Phosphorus is valuable after the acute stage or stage of development has passed, and during the period of convalescence. It is valuable when the prostration is extreme, when nervous exhaustion is conspicuous and typhoid symptoms are apparent and where the general nutrition of the patient is of primary importance.

Rhus toxicodendron, *baptisia tinctoria*, *cactus*, *apocynum*, *avena sativa*, *gelsemium* or the bromids for extreme nervous excitement, *quinin*, *digitalis* and *strychnin* or *nux vomica* and *iron* may be indicated in this disease. Care must be taken to select and adapt the exact remedy to the specific indication.

CROUPOUS PNEUMONIA.

Synonyms:—Pneumonitis; lobar pneumonia; fibrinous pneumonia; lung fever.

Definition:—An acute disease, characterized by a specific inflammation of the lung tissues, accompanied by an exudate of coagulable lymph on fibrin, which results in consolidation of the intimate structure of a lobe or lobes, rendering the air cells impervious to air.

Correctly considered the term pneumonia comprehends a condition of the parenchyma of the lung, in which, with initial hyperemia and acute or sub-acute inflammation, there is consolidation of a portion of this structure.

An occasional writer of prominence describes the primary pathological condition of this disease as if the hyperemia or congestion was the result of a previously existing inflammation, as if the initial condition was inflammation. To us acute inflammatory action has for its basis hyperemia, from which it develops, and if hyperemia, congestion or initial engorgement can be prevented *in toto* there can be no inflammation. This preliminary hyperemia is induced

by the local irritating influence of that which is recognized as the cause of the disease, whether it be a specific micro-organism, exposure to cold or any of the many other possible causes.

In the processes of the development of this disease, which is usually confined to one lobe (although it may involve the entire lung, or as in so-called double pneumonia, involve both lungs), there are three distinct stages recognized. The first stage—the initial or preliminary stage, without which there can be no actual acute inflammation—is the **stage of engorgement**. In this stage the capillaries throughout the intervesicular structure, from the irritation referred to, become dilated and loaded with blood. Quickly following, in the natural course, the air cells and bronchioles are filled by exudation, with a fibrinous material, mixed with both white and red blood corpuscles and serum, from which that portion of the lung becomes less resilient and impervious to the passage of air. The lung is increased in bulk, swollen or distended, becomes heavier and firm to the touch and does not collapse upon opening the chest.

After perhaps forty-eight hours, as the disease progresses, the **stage of red hepatization occurs**. The swollen condition of the diseased portion of the lung becomes greatly increased, the tissues become solid and firm, the lumen of the alveoli is abolished and the structure of the tissue is dark red, mottled and friable, devoid of crepitation as the air is excluded, and an excised piece will sink in water. Its surface will show the impress of the ribs. The air cells, air passages and bronchioles are completely plugged with fibrin. This stage of the disease may exist for from five to seven or eight days.

The third stage of the disease is its terminal stage—the **stage of resolution or gray hepatization**. In this stage the extravasated cells undergo fatty degeneration, the fibrin becomes softened, there is an increased quantity of leucocytes and the red blood corpuscles have disappeared. A

cut surface of the lung tissue will show a grayish appearance, is mottled in color, and from it yellowish white fluid will exude. The friability of the lung tissue is increased, absorption and expectoration of the exudative material follows, unloading the air cells, which return to their normal state and gradually resume their function as the lining epithelium is renewed.

In cases that terminate unfavorably there may be an infiltration of pus cells through the interstitial structure, or there may be abscess or gangrene, or in cases that do not prove fatal, but become chronic in character, an actual induration may result from the formation of new tissue in the air vesicles, or in the interstitial tissues, or in both, connected by fibrous bands, which are supplied with blood vessels.

Etiology:—It is the author's opinion that in the treatment of this disease the predisposing causes are of more importance and should receive greater attention than the actual exciting cause, which is undoubtedly the specific micro-organism, the *micrococcus lanceolatus* of Fraenkel, known as the pneumococcus.

The predisposing causes are many. The most common are sudden temperature changes, and cold, which is a most direct and potent factor in the production of the abrupt or acute congestion, and ultimate stasis, upon which the inflammatory action depends. Cold not only induces this preliminary pathological condition, but it renders the structures unduly susceptible to the action of the specific germ. That cold has much to do with the production of the disease is proven by the fact that in November, December, January, February and March a very large percentage of the cases occur, and that very few, if any, cases occur during the steady heat of the summer.

The disease most commonly occurs sporadically, as the individual is alone brought into contact with the causes. Endemic outbreaks occur also, from a number of individuals having been brought in contact with the same

cause. In one family, under the author's observation, which consisted of four children, a defective furnace failed entirely during a severe spell of weather. Each member of the family suffered from a severe cold. The children were attacked one after the other with acute pneumonia. The mother took care of them all for several days, the father going away to his work. The father was then attacked, and a nurse was employed, but the mother escaped. A number of individuals in the same tenement house, or in an institution, a hospital ward, or in a prison, may be attacked within a limited time. But while the disease may be very prevalent in any given locality, it is doubtful if it should be said to be ever truly epidemic in character.

This form of pneumonia is more frequent during full adult age, and among males than females, due to the more frequent exposure to the inducing cause, as out-door employment and alcohol. It occurs without regard to sex, in infancy, in childhood and in old age. If the lower classes and the poor are more frequently attacked it is probably from want and lack of proper protection. Alcoholics are especially liable, and those who suffer from chronic organic disease. Those who have suffered nervous shock, or who have sustained a severe injury of the chest walls, especially direct injury, or who suffer from burns, or those who have inhaled smoke, fumes, gases or hot air, are liable to attacks.

Not only is there no immunity to the disease, conferred by an attack of pneumonia, but the patient, once attacked, is rendered susceptible to future attacks, a number of which may occur with increasing frequency or at irregular intervals. The susceptibility, however, is decreased as time passes without a recurrence. The disease also follows other acute diseases, notably influenza.

Symptomatology:—The symptoms of acute pneumonia vary greatly in different patients, each presenting the evidences of a typical case. There is a **distinct** chill, which may be prolonged for from one to three hours, dur-

ing which **the temperature** rises rapidly until it reaches from 103° to 105° F. within the first twenty-four hours, and continues, but with remissions, for from five to nine days, when the crisis will occur. With the occurrence of the fever **the secretions** are suppressed, **the face** is flushed, especially that cheek on the affected side, which is apt to show a circumscribed bright red spot; **the skin** becomes dry and hot; **the pulse** is quickened and **the respiration** increases in rapidity, as there is an increase in the amount of lung tissue involved. The relation between the pulse rate and the temperature, when the disease is well established, is somewhat characteristic, as the pulse is apt to be much slower than is usually the case with so high a temperature. It is not uncommon to observe a large, round, full, rather hard pulse of only 90 or 95, with a temperature of from 103.5° to 104° F., and respirations from 30 to 36 per minute. Neither is the pulse rate greatly increased as the respiration is increased. The patient becomes rapidly prostrated, is restless, with perhaps slight **delirium**, with much headache. **Pain** is present in the affected area, but it varies greatly with different patients; with some it is complained of bitterly, and is acute, lancinating or cutting in character, especially if the pleura be involved. With this there may be an absence of deep soreness, or there may be extreme soreness and tenderness over the affected area, which is increased by movement or percussion. Infants will cry out during percussion and also when lifted by placing the hands around the chest in the axillæ. With other patients there may be only **extreme soreness**, or there may be an absence of both pain and soreness, or pain may be present on inspiration only, and thus cause irregular, jerky and imperfect respiration, from which, in a short time, there will be more or less cyanosis. Occasionally the pain is referred to the abdomen, in the side or loin or to the location of the larger abdominal glands, or to some other distant location. Nervous excitability

and irritability are often present, and intractable insomnia is a very common accompaniment.

The interrupted inspiration, a little short jerk or catch in each inspiration is quite characteristic of the disease in infants. It will occur in each of three or four efforts consecutively at deeper inspiration and is followed by several short and very shallow respirations. In some cases **cough** is present from slight bronchial irritation and hyperemia, before the attack of pneumonia. If so, it will usually increase in severity most materially during the first twenty-four hours. In other cases it is concurrent with the rise of temperature and increases as the temperature increases. When so occurring it is usually dry and distressing, or exceedingly painful in character. Later there is some little expectoration, which, as it increases, becomes somewhat uniformly stained with blood. This appearance is characteristic of this disease, the sputum being designated as "**rusty colored sputum.**" Later the sputum becomes tough and tenacious in character, is somewhat gelatinous and contains both white and red blood corpuscles, the characteristic bacilli and other micro-organisms.

In the stage of gray hepatization, as the inflammatory symptoms abate and resolution progresses, the **cough** may increase as the expectoration of the inflammatory products becomes active and is moist in character, usually much less painful, and the expectoration is very free.

Sometimes in the early stage of the disease there is an entire absence of cough for perhaps two or three days. This the author has noticed in a number of cases, especially among children.

Vomiting may occur early, with complete loss of appetite and excessive thirst. **The urine** is dark colored, scanty, of high specific gravity, although with diminished chlorides. Often uric acid and the urates are perceptible when the urine is cooled, and later albumin is found present. Constipation is quite constant, although instead there may be diarrhea.

There is an occasional case of croupous pneumonia, which, in its initial stage assumes a markedly congestive type. There is the severe chill, with extreme coldness of the extremities and the skin. The temperature at first is low, perhaps subnormal. The congestion, as in one of the author's cases, attacks the entire lung structure, with all the symptoms of pulmonary congestion elsewhere described. This patient, a miner, had been lying in a wet place, on the floor of the mine, in a strong draught, undermining a stratum, lying partly in the water, with his clothes saturated all day.

In these cases the reaction takes place very slowly. Difficult breathing is pronounced from the first, and unless the reaction is induced by active measures will increase and become labored. The face is bloated and of a dusky hue, becoming purplish, the hands are cold and the finger nails are bluish and dark. The temperature will finally rise and quickly reach a high point, perhaps 104° F., with increasing difficulty of breathing, and yet the skin and extremities continue cold. The patient is dull and listless, is not easily aroused and dislikes to talk or does not heed what is said. Cough is usually present, almost from the onset of the congestion. It will vary in character, but is dry and irritating and usually short or barking and quite continuous. The pulse is slow, and when the temperature has reached a high point is not rapid in proportion, seldom exceeding 110 beats per minute, and is usually from 80 to 95 per minute. The respirations, still labored, however, increase in rapidity with the increase of the temperature, and later the breathing becomes rapid and shallow, with cyanosis. This form of the disease occurs more often in men and in those previously in excellent health—is pronouncedly sthenic in type—perhaps because these expose themselves by their habits and employment to the severe conditions which induce it.

This disease occasionally assumes a distinctly adynamic type when prolonged, and in some cases, where the pa-

tient has been previously enfeebled and the blood poor, almost from the first. With the high temperature the pulse is rapid and feeble, the respiration is rapid and shallow, the patient restless and delirium is apt to occur. The mouth becomes dry, the tongue dry and elongated and is soon coated with a dark brown coat; the mucous membranes are red or dark, and there are sordes on the teeth. The symptoms are pronouncedly **typhoid** in character. In some cases the skin becomes slightly jaundiced, there is tenderness over the liver and the spleen is enlarged. Prostration is extreme and the delirium is soon accompanied with or is followed by stupor.

This form occurs when the disease follows other serious acute disease, or where the patient is greatly enfeebled, and especially in alcoholics, or if, with the onset of the lung inflammation, there is septic infection. It occurs also with those suffering from chronic disease, and especially during the progress of a chronic disease of the kidneys or bladder. Per contra, an acute attack of pneumonia may occur during the progress of a severe case of typhoid fever, when the symptoms will be much as described. In either case it is designated **typhoid pneumonia**, although the term is more correctly applied when the pneumonia occurs primarily.

Pneumonia in the aged, **senile pneumonia**, develops without the classic symptoms looked for in middle life. With rather suddenly increased prostration the patient may become seriously ill before evidences of lung involvement are pronounced. When these appear they are somewhat varied in character. The quickened respiration, slightly increased temperature and nervous phenomena do not point strongly to the lung, as there may be an absence of pain, dyspnoea, cough or expectoration. Usually, however, one or more of these symptoms in a mild form are present. Examination of the chest, which may be made only incidentally, will show impaired respiratory movement and dulness on percussion, which is the most conspicuous

symptom, and perhaps some sub-crepitant râles, with tubular breathing. The exact condition may be exceedingly difficult of diagnosis, as the symptoms are deceptive and misleading and may terminate fatally before a diagnosis is determined, or suddenly, when the condition was not thought to be at all serious.

Pneumonia often develops during childhood with signs of profound central nervous irritation, with convulsive phenomena and delirium, or stupor, which point strongly to meningeal inflammation and are consequently misleading and deceptive. Or these symptoms may be pronounced, and an actual meningitis may exist conjointly with the characteristic lung phenomena, although this complication is rare. It is more apt to occur after the lung disease has progressed actively some days, or has run its full course.

The author has observed all the respiratory and physical signs of pneumonia in childhood with an absence of cough for the first two or three days. The rusty colored sputum is usually absent also with these patients. Children are more amenable to treatment than adults and recover from the disease more readily and the mortality is lower.

The inhalation of **ether** has a notable influence in reducing the temperature of all patients. This general reduction of temperature with the irritating influence of the ether in the bronchioles and air cells, in an occasional susceptible patient, tend to induce a typical pulmonary congestion. Reaction follows and fever occurs, with pain in the chest, cough and other characteristic symptoms of acute inflammation.

Alcoholics develop pneumonia readily and in a severe form, with the characteristic lung phenomena. The delirium usually becomes extreme and violent, often maniacal and adynamia quickly supervenes. Even with the most careful treatment these cases are usually fatal.

Other complicated forms of croupous pneumonia are **malarial** or **bilious pneumonia**, which occurs when there

is malarial intoxication, which presents evidences of some hepatic congestion—**migratory pneumonia**, which is simply the transplantation of the disease to the other lung or to another locality in the same lung, when the whole lung is not involved—and **latent pneumonia**. This is a questionable form of the disease and may be only a congestion and consolidation of a given area during other diseases, without signs of actual inflammation. The characteristic microbes, however, may be present, and later rusty colored sputum may appear.

Croupous pneumonia usually runs its course within twelve or fourteen days, and occasionally within seven days, or it may be prolonged to three or four weeks. Complications may greatly prolong convalescence and the disease may terminate in abscesses, in gangrene, or in a chronic form of the disease, or tuberculosis may develop from it.

Physical Examination:—In the congestive stage there is deficient motion, with imperfect chest expansion in the diseased side, without evidences of consolidation on percussion. The respiration is largely bronchial, with small crepitant râles in the diseased area, while the normal heart sounds are all exaggerated. This must not mislead the physician in his location of the inflammation. Later, as the disease develops, percussion reveals impairment of resonance, increasing to dulness, if near the surface.

The motion on the diseased side is absent on inspiration, while the side is found to be enlarged when measured. Usually the breathing sounds in the air tubes or bronchi can be heard distinctly, unless the consolidation affects the bronchioles and smaller tubes. Bronchophony is distinct. In the final stage the vesicular breathing returns and there are moist râles.

On palpation there is an increase of the vocal fremitus, at first slight, in the area of hepatization, later more pronounced, with absence of expansion, with perhaps fric-

tion fremitus. With the stage of resolution these disappear and the vocal fremitus diminishes.

Differential Diagnosis:—The disease is distinguished by an absence of bronchial symptoms from bronchopneumonia; from pleuritis by the local, initial, sharp, acute pain on inspiration of the latter disease, with the effusion; from pulmonary edema by the fact that in edema fever and the constitutional symptoms of this disease are absent; from acute tuberculosis by the sweats and diarrhea, which are an early accompaniment, and by the presence of the tubercular bacilli. In the early stage of tubercular invasion a differential diagnosis is often quite difficult.

Pneumonia may be complicated by the occurrence of acute bronchitis, which will increase all the existing phenomena. It is not unusual for a portion of the pleura to become involved early; in fact, it is doubtful if the pleura is not involved to a greater or less extent in most cases, resulting in an actual pleuritis. If this is extensive and is accompanied with effusion, it has in the past received the name of **pleuro-pneumonia**. It is not, however, a form of pneumonia, but the conjoint existence of the two diseases.

Other possible complications are bronchiectasis emphysema, hydropneumothorax, pericarditis, endocarditis and evidences of other heart involvement, with meningitis and peripheral neuritis or mild paralysis. There may also be present a gastritis or gastro-enteritis, usually catarrhal in character, and, as stated, the liver and spleen may be attacked also in extreme cases, with peritonitis, nephritis or cystitis, of which nephritis is perhaps the most common.

Prognosis:—In uncomplicated cases the prognosis is good. Individuals in previous good health, with good care, should resist acute complications to a large extent. Alcoholics, or those in whom there has been a previous discrasia or tuberculosis, will succumb to this disease in perhaps 25 to 30 per cent of the cases. The health reports of

large cities show an exceeding high death rate, which seems to have greatly increased within the past ten or fifteen years. It is the author's opinion that in private practice, with patients in fair circumstances, the mortality should not reach five per cent, and with all cases it should not exceed ten per cent.

Treatment:—The severe measures of the past, the anti-phlogistic and stimulant course of treatment have resulted invariably in a high mortality. A method of treatment which has produced the most satisfactory results is based upon the fact that the disease is rapidly devitalizing and will admit of no harsh measures, but demands the utmost gentleness and care in its treatment, and great skill in nourishing and sustaining the patient, without unduly stimulating the nervous system or the heart.

There are certain theories and measures yet adopted by the profession at large in the treatment of this disease which have been handed down for many years past, but which are not proven by statistics to have been of great benefit.

The first proposition is that fever is not harmful, but may prove beneficial. This is advocated by a number of writers: No greater fallacy than this was ever enunciated, and only harm can result from its acceptance. One of our writers referring to this statement tersely says, "I would think it as reasonable to tell a man when his house was on fire that the fire was a conservative element, that it was a thorough disinfectant, and would rid his house of vermin, as to tell him, when his wife was suffering from the effects of the high temperature of acute pneumonia, that the fever was a conservative element, a beneficial factor of the disease, that it was favoring tissue metabolism and aiding in the destruction of the specific poison."

The second fallacy is that the theory of the microbic origin of the disease must have first attention in the treatment by the adoption of an antiseptic course, to the exclusion of other measures. It is our experience that antisep-

tics are not beneficial in this disease until in the course of its advancement, there is apparent breaking down of tissue and threatened sepsis, announced by the appearance of those phenomena which are characterized as typhoid. They should be used also, when evidences of abscess appear in the later stages of the disease, but they must not be depended upon for the amelioration of the total processes.

A third fallacy is that local or general depletion is of permanent benefit. The common sense of the profession at large has long since discarded blood letting, although an occasional writer will yet advocate it. It is not suggested or adopted by the busy, practical, rational, family physician. It is difficult for the profession to rid itself of the idea that an active physic at the onset of the treatment is necessary with which to thoroughly "sweep out" the intestinal canal.

With us a simple laxative, if constipation be present, or a thorough colonic flush is all that is necessary. Disorders of the stomach and pre-existing diarrheas must receive attention, as they will interfere with the nourishing of the patient, will reduce his strength, and encourage the progress of the disease.

Another fallacy is the adoption of persistent stimulation from the onset of the disease. Nothing can be more erroneous than that the heart must be stimulated from the first against possible failure later on. We advocate sustaining the strength of the patient, but to give no heart stimulant whatever until there are evidences of approaching heart weakness. In all the cases that I have observed where strychnin and quinin were given indiscriminately in the early stage of this disease, I have been confident that the temperature has been increased, a high temperature sustained, the nerve tension exaggerated and a condition of general nervous excitability induced.

This results in an aggravation of all the symptoms and antagonizes the action of specific remedies. Delirium often

follows also, and we have laid it down as one of our basic principles that as long as delirium is present we are unable to obtain the satisfactory influence of our remedies. These must be directed to the delirium after the cause has been removed.

Still another common fallacy is that the use of cold applications to the chest in antagonizing the advance of this disease, is a rational procedure. The influence of cold upon the capillaries produces congestion, and if persisted in, blood stasis. It induces within the capillaries the exact pathological condition that the causes of any acute inflammation induce. While it primarily produces contraction of the capillaries, secondarily the blood current is slowed and the passage of the corpuscles through the minute capillaries is greatly impeded.

It adds no force or power by which the venous capillaries can empty themselves, while the force of the circulation is continually filling the arterial capillaries. The highly essential metabolism, the throwing off of tissue waste is at once retarded, inhibited, or made impossible by the action of cold. A certain amount of the excess of heat is abstracted, but the fuel is piled up on the smouldering fire, for ultimate greatly increased combustion.

On the other hand, heat applied and persisted in, over the entire diseased area, is a most potent and physiological antagonist to those essential conditions which are directly induced by the causes of the disease, and from which all ultimate pathologic results must develop. It is profoundly stimulating, and while local heat from undue combustion is present, the applied heat stimulates the capillaries and physiologically unloads the venous capillaries. At the same time it stimulates the arterial capillaries through its influence upon the peripheries of the nerves, and secondly upon the nerve centers, to drive the accumulating tide through the engorged vessels, thus unloading them into the veins. It thus carries off the accumulating waste, brings into the capillaries a new tissue supply and quickly restores the

harm that has been done them in the primary congestion. It is a most rational procedure. It is logical, it is reasonable, it is physiological, and it is highly scientific. And such a course is always acceptable. We advise the application of heat at once and that it be persisted in as long as benefit is apparent from the abatement of the symptoms. It cannot possibly do harm.

Finally the opium fallacy must have some attention. The first influence of this remedy in small doses is that of a stimulant, but this influence is so transient that it must not be relied upon. The ultimate result of the influence of opium and morphine upon the capillaries, when given to control the pain of pneumonia, is much the same as that induced by the causes of the disease and by cold. It also paralyzes the nerve endings, as well as induces inactivity of the nerve centers. It slows the capillary circulation, inducing, as is well known, venous stasis, and thus contributes to the local hyperemia. It in no way facilitates normal tissue metabolism, nor the unloading of the morbid matter, but it greatly retards excretion, while it masks or holds in abeyance the evidences of the disease and encourages the advancement of the disease processes. If it is used to subdue the pain, at any time, it should be used in small doses, carefully repeated, and its deleterious influence upon the capillaries should be directly antagonized by heat and belladonna. I have been confident in the past that patients to whom I had been called late, ultimately succumbed to pneumonia because of the use of this remedy. It is especially contra-indicated in conjunction with cold. A careful study of rational specific measures will teach the immediate reduction of pain without opium.

That there is a possibility of the jugulation—the complete abortion—of this disease at its onset is no longer a question of doubt. It has been accomplished sufficiently often, under favorable circumstances, to establish it as a certainty. The cases in which this is possible are the sthenic cases, and those in which there has been

no previous disease, and where the case has occurred abruptly with the typical acute development, both in pathology and symptomatology.

If seen during the onset of the disease, within perhaps twelve hours after the occurrence of the initial chill and fever, the patient should quietly, without effort on his own part or excitement, be given a hot sitz-bath for about twenty minutes, with the chest and body well covered, or he should have a most thorough hot foot bath, into which strong mustard has been stirred. A deep wooden pail or foot bath tub or wide deep jar should be used, so that the legs, nearly or quite to the knees, may be immersed, and retained until from twenty to thirty minutes, until they are very red, but not blistered with the mustard. During this time, the patient being thoroughly wrapped in blankets, may at first take from ten to fifteen minims of jaborandi in a teacupful of hot water, or he may drink a hot infusion of asclepias, or in the absence of these, a bowl of hot ginger tea made by adding a dram of the tincture of ginger to half a pint of hot water. The foot bath ended, the patient should be quietly put into a warm bed. The diseased area should be covered with libradol, with antiphlogistine or with the official Kaolin dressing. A rubber water bag containing a half pint of hot water, all air excluded, should be laid over this dressing.

If libradol be used it should be removed at the expiration of six, eight or ten hours, unless the patient should become nauseated early, in which case it should be immediately removed. Either of the other dressings may remain undisturbed for twenty-four hours, with the external heat persistently applied. If perspiration be induced, this may be continued mildly for two or three hours. Other remedies will be indicated and they may be administered as suggested further on. This prompt course or a similar one will occasionally abate the inflammatory processes within forty-eight hours, with no further development, and no results of the disease action except weakness, from which, with the

proper tonics, the patient will speedily recover. I have also succeeded in jugulating the disease in abrupt cases with *veratrum*. The patient should be kept in his room for perhaps a week, with an equable temperature and a moist atmosphere. Great care should be exercised in going out, as the patient will be very susceptible and liable to a return of the disease for an entire season.

In instituting the rational treatment of the disease, when an attempt at its abortion is not expedient, or when such an attempt is unsuccessful, the closest attention should be paid to every evidence of the disease, and the specific indications must be met with precision and exactness. The physician must determine most carefully the exact pathological factors as they develop, recognizing them promptly and meeting them with positiveness and assurance. The treatment must be conducted rationally; the action of the remedies directed in strict physiological lines. Everything must be done with confidence, but without haste, excitement or confusion. The patient must be kept tranquil and quiet, and should be disturbed as little as possible, and talking on his part should be prohibited entirely. Nothing whatever advised should induce pain or nervous irritation, nor should it in the least weaken the patient or lessen even temporarily his vital force.

Two factors in this condition must have our first attention. These are the initial **capillary congestion** within the pulmonary parenchyma in the diseased area and the **temperature**. If in the onset the disease is of the congestive type, as will be determined from the symptoms which we have named—the skin cool and respiration somewhat difficult—the indications demand **belladonna** and prompt **external heat**, applied over the entire chest. If profound congestion be present the patient should be put into a hot bath or wrapped in a blanket wrung out of water at a temperature of from 85° F. to 95° F., and this covered with dry blankets and retained for perhaps an hour or until the chill has passed. In this type of the disease **veratrum** exercises

a most satisfactory influence, but the indications are those of belladonna, and the two remedies may be given conjointly or alternately. The skin is cool and the extremities cold, the face is dusky or dark in color and has a cold, blue look, the breathing is labored and slowly increasing in rapidity, and the patient is dull and listless, the eyes dull and the pupils somewhat dilated. The pulse is large, full, soft and compressible and probably not above 100 per minute. The temperature is above 102.5° F. and rapidly rising. With these indications veratrum should be given in minim doses every hour, in markedly sthenic cases, until the pulse is reduced to seventy beats per minute. It should be then given in half minim doses until the pulse reaches 60 or 55, unless vomiting occurs, when it should be stopped. It should be then withheld for a few doses in order to determine whether the temperature will continue to decline or will increase. If the reduction is not sufficient it may be given in small doses through the first two days, after which time it is seldom indicated.

It is common practice to give veratrum alone when the indications are typical, as those just named, but ten minims of specific belladonna in four ounces of water, given in dram doses every hour, will intensify its action. This agent is a most positive and direct physiological antagonist to the essential factors involved in the initial congestion and the pathological elements which succeed it in order, in the progress of the development of the disease. It is an active stimulant to the capillary circulation, increasing to a marked degree capillary action, driving the blood out of the venous capillaries and stimulating the activity of the arterioles, thus quickly unloading the congestion. It equalizes the circulation through its uniform influence upon the entire capillary system. It acts in perfect harmony with other special sedatives, although not in itself a sedative to the fever processes.

In the usual development of this disease, while the congestion is developing in the pulmonary structures, there is

the initial chill, with temperature rapidly increasing, with flushed face, dry, hot skin and rapid respiration, the pulse is hard, sharp and rather small and usually quite quick, beating perhaps from one hundred to one hundred and ten per minute in adults, and from one hundred and ten to one hundred and forty per minute in children. Belladonna should be given in small doses in this stage, but **aconite** should be given also for its influence upon the fever. This agent is antagonistic to the congestive processes to a degree, and thus acts in perfect harmony with belladonna. It promotes tone and power in the arterial capillaries, it retards exudation, hepatization, suppuration and adhesion, more certainly antagonizing the inflammatory processes than any other purely sedative remedy; it also hastens resolution and promotes absorption of the inflammatory products. From three to five drops of specific aconite in four ounces of water, given in dram doses every hour, or to children in half-dram doses every half hour, is sufficiently active dosage. With the exception of veratrum in the sthenic cases we do not advise any remedy in sufficiently active dosage to in any way depress the system or reduce the actual power of the heart. The influence of aconite in slowing the heart and reducing the temperature is exercised in a manner much superior to that of actual depression. It inhibits the action of the heat centers, relaxes the sudoriferous glands and yet stimulates them to increased activity, thus promoting the radiation and dissipation of the heat. It antagonizes also the local processes of heat generation in the inflamed area. Its restraining influence on increased heart action is kindly and not depressant. It may be given alone in this disease in small doses frequently repeated, and may be continued as long as the temperature remains high, with the very best of results. No evidences of depression will appear from its use.

Another remedy of prime importance in pneumonia is **bryonia**. With this remedy alone the author is confident that very many uncomplicated cases will be greatly

abridged in course and severity without other medication. The agent is physiologically adapted to the underlying pathological processes. It controls the fever processes and those conditions which are involved in the evolution of the disease. It is continued throughout the course of the disease, whether the patient be feeble or not, if the following indications are present: Pain in the diseased area, which is aggravated by motion, elevated temperature, with a hard, frequent, vibratile pulse, with deficient bronchial secretion. The cough, if present, is dry, short, harsh or hacking, and the local soreness is increased by the coughing. The pain and soreness are relieved by lying on the inflamed side, the face is flushed and the cheek on the affected side has a central, bright red, circumscribed spot. All prescribers who have had experience with this remedy are enthusiastic concerning its influence in antagonizing the inflammation, as it acts similarly to and in some ways superior to aconite. It is specific in its influence upon the pain. Although this influence is not as immediate as opium, it is in line with physiological influence of the agent in abating the processes of the disease. In retarding exudation, hepatization, supuration and adhesion, and in promoting the removal of the inflammatory products, especially preventing serous effusion. There is an essentially harmonious action between this remedy and aconite. In all acute diseases of the thoracic viscera both should be given, as has been stated, in very small doses, which should be frequently repeated. This statement is reiterated because of its exceeding importance.

Another essential remedy is *ippecac*. This remedy soothes irritability in the lung structure and in the bronchial tubes with positiveness. It should not be given in sufficient dosage to induce even the least nauseating influence. From two to six minims of the specific medicine in four ounces of water, in dram doses every hour or two hours, will allay the pain, sooth an irritating cough, remove distress and assist the other indicated remedies in promoting resolu-

tion. It is equally efficient when the bronchial tubes are involved. When resolution has occurred and hepatization remains subsequent to the decline of the fever, this remedy may be administered to adults in much larger dosage. It has been the author's habit after the fever has abated during the earlier stages of convalescence to combine it with the **quinin bisulphate**—one-fourth of a grain of powdered ipecac to two grains of the quinin salt. When the general nervous force is weakened one-fourth of a grain of the extract of **nux vomica** may be added to this in a capsule and the whole given every three hours.

The above remedies named comprise the essential ones in the treatment of this disease. There are, however, a number of others whose indications are frequently met with. These we will mention briefly.

Rhus toxicodendron is of service when the pulse is sharp and hard, the temperature high, the tongue red, elongated and pointed, with a pointed tip, the mucous membranes red, and when the pain is relieved by movement and increased by excessive warmth; when the face is flushed a bright red and there is headache or supra orbital pain. The dose must be very small.

The indications for **gelsemium** are those of cerebral hyperemia, which is apt to be one of the developing symptoms of the disease in childhood, and which may be accompanied with convulsions. From five to ten drops of the specific medicine, in early childhood, and from ten drops to a dram, in adult age, may be added to four ounces of water and administered in dram doses every half hour or hour while this stage lasts. The symptoms are a brightly flushed face, bright, sharp eyes, contracted pupils, great restlessness and excitability, with a high degree of nerve tension, increased heat in the head and face, hot, dry skin, sharp and quick pulse. It has a pronounced influence upon the heart's action with these symptoms and reduces the temperature. When there is pronounced weakness of the

nervous system it must be given in smaller doses and continued only during the active period of the excitement.

Asclepias is indicated when with the inflammation in the lung structure the pleura is involved, as is shown by the characteristic, acute, cutting pain on inspiration. It is also a most excellent sudorific and is indicated when the skin is dry and the secretions are deficient. It works in harmony with aconite. It is also of value when the progress of the disease is slow or when it assumes a chronic form, when it materially assists in removing effusion. It acts more promptly during the course of the fever, over which it exercises a sedative influence.

Sticta pulmonaria is demanded when there is sharp, quick pain under the shoulder blade or when the pain extends to the back of the neck, into the occiput or through the shoulders; when there is soreness or dull pain in the chest or in the extrinsic respiratory muscles, which is increased by deep breathing; when irritative cough is persistent, dry, short, sharp, hacking in character or wheezing or rasping, with quick darting pains in the chest walls. It may be given in conjunction with any one of the other remedies, especially with the sedatives.

Cactus grandiflorus is important in the advanced stages of the disease, when the first evidences of heart weakness appear. Its essentially nutritive influence upon the heart muscle, through a direct tonic effect which it exercises on the central nervous system, makes it an essentially valuable remedy. In asthenic cases it steadies the action of the heart, improves its tone, increases arterial tension and certainly reduces both the pulse rate and the temperature. It may be given in from one to five minim doses every two hours.

Digitalis is not indicated until the evidences of heart failure are actually present, although we have reason to believe that in an indirect manner and inferior to the remedies we have named, in small dosage it will antagonize the development of pneumonia. It whips up the heart, increasing

its action and increasing arterial tonus, thus tiding the patient over a crisis until the influence of restorative tonics can be obtained. From two minims to ten minims of the tincture may be given every two to four hours.

We have referred to the action of **quinin** bisulphate in its tonic influence and as overcoming hepatization and thus restoring the functional action of the air cells. Its action is not limited to this influence alone, it restores the tone and vigor of the entire nervous system and the stomach and intestinal tract. It improves digestion and facilitates the appropriation of nutrition. The remedy is also demanded in malarial pneumonia, to antagonize and destroy the plasmodium malarie and to overcome periodicity, but it must be remembered that the specific symptomatology of the quinin salts are as exact as those of any other specific remedy. The temperature must be falling and not above 101° F., the skin must be soft, the pulse soft and decreasing in rapidity, the secretions must be restored, the tongue moist and inclined to clean. Under these circumstances only favorable results will occur from the use of this remedy. If in the course of the periodicity this group of symptoms occurs at a given time each day, or on alternate days, with active symptoms at all other times, the agent should be given only during the time these symptoms are present. Capsicum may be given in conjunction with this remedy and will enhance its action.

Hydrastis canadensis is given during convalescence through the entire period. It is a pure active tonic. It materially improves the functional action of every organ. It may be given alone or combined with quinin, iron or nux vomica, or these remedies are sometimes all combined. This, however, is unscientific, although the results may be satisfactory.

Strychnin is useful in the markedly asthenic cases and where heart failure is imminent it should be given only as needed in the form of the sulphate or the nitrate in from one one-sixtieth to one-twentieth grain doses. It is com-

monly given in conjunction with digitalis, as it exercises upon the nervous system, and through that upon the heart a similar influence. This remedy, if given during the early stage, in a sthenic patient, when there is nervous irritation, with high temperature, will exaggerate all the symptoms of the disease. I am especially favorable to the action of the strychnin arsenate in its tonic and restorative influence.

The **ammonium chlorid** is administered during the progress of the disease, when expectoration is deficient and when it is desirable to expel the exudative product from the air cells, which has induced the consolidation. It is indicated when there is a short, dry, irritative cough and when the cough induces soreness of the chest, especially if present or accompanied with prostration or increasing weakness.

Echinacea is indicated only when the products of microbic invasion or when the result of prolonged high temperature induce evidences of depraved blood and toxæmia. When typhoid phenomena are present this agent is given persistently from their first appearance in ten-minim doses every two hours, in conjunction or alternating with one or more of the remedies which have been named, as shall be indicated. In addition to a profoundly alterative influence its superior tonic and restorative effect will enable it to exercise a satisfactory sedative influence upon the fever and upon the inflammatory processes. Its influence must be known to be fully appreciated.

PULMONARY CONGESTION, ACTIVE.

Synonyms:—Hyperemia of the lungs; congestion of the lungs; acute pulmonary hyperemia.

Definition:—A sudden engorgement of the capillary circulation of the lungs and smaller bronchial tubes.

Etiology:—An active congestion of the capillary circulation exists as a precedent pathological condition—the initial condition of active inflammation of any organ, and is especially apparent, as preceding the phenomena of inflammation in the lungs and bronchial tubes. But an extreme engorgement independent of the phenomena of inflammation may exist as the result of persistent inhalation of very cold air, or the inhalation of cold air heavily charged with moisture, or as the result of prolonged talking in the cold air. This form of congestion I desire to consider here, although it may be the precursor often of bronchopneumonia. The writer treated a typical case in a middle-aged man of previous excellent health, who as auctioneer, had a few hours before the attack, sold at auction the entire equipment of a large farm. The man had stood in an elevated position in the wind, with the temperature about ten degrees above zero, and had talked violently for six or eight hours. He was attacked during the following night with great oppression of breathing, with at first but little change in the temperature. He had been chilled during the day and the sensation of chilliness had continued. The skin was cold and the patient had great disinclination to any exertion. From the onset of the attack he was inclined to yield to it and give up without effort. The pulse was at first slow and labored, but as the difficulty of breathing increased, as it did rapidly, the pulse became rapid and feeble and easily compressed. The face became livid and finally cyanosed, the lips blue and the breath seemed cool. The breathing increased greatly in rapidity as the congestion advanced.

Other causes of active congestion of the lungs are the

inhalation of caustic and pungent vapors and of steam and other irritating substances.

Symptomatology:—The symptoms as narrated in the above case, although exaggerated, are peculiar to those cases in which the cause does not irritate the mucous membrane of the respiratory passages. When such irritation is induced there is apt to be more or less **cough**, with the expectoration of blood. There are but few other symptoms. Percussion reveals a uniform dullness over the entire lung structure, as the condition usually involves the entire breathing surface to greater or less extent. As the disease advances, while the **chilliness** may remain, there is a rise in the temperature, and if the congestion is relieved by active treatment so that the respiration may become free, symptoms of inflammation of the lungs or of the bronchial tubes may appear at once and run the full course of an ordinary acute inflammation.

Diagnosis:—The history of a recent exposure, with some difficulty of breathing since the exposure, slowly increasing, with a tendency to coldness and extreme difficulty of breathing, suddenly occurring and rapidly increasing, are unmistakable evidences to one who has had any experience with this class of cases.

A careful consideration of both causes and evidences will make it possible to readily distinguish between pulmonary congestion and pulmonary apoplexy.

Prognosis:—If seen early and subjected to the most vigorous treatment these patients recover with no serious results from the attack. Those in which the cause was extreme, inducing profound congestion quickly, may die before benefit can be obtained from the treatment. Inflammation following primary acute congestion is resistant to treatment and is likely to result fatally.

Treatment:—The most perfect, the most rational, the physiological antagonist of congestion, is **persistent heat**. The physiological medicinal antagonist is **belladonna**, which may be associated with other stimulants. In the case

above narrated the patient's chest was wrapped in flannels wrung from hot mustard water, the feet, legs and hands were immersed in a hot bath and the patient was made to breathe warm, moist air. Internally a drop or two of the tincture of belladonna was given every half hour, with occasionally a tablespoonful of equal parts of **brandy** and **water**, sweetened. This was in every way sufficient for the congestive phenomena. The extreme heat was without doubt the most potent factor in overcoming the congestion.

When the condition is induced by the inhalation of irritating substances, the cause must be removed, the air should be warm and charged with some soothing medicament; heat should then be applied over the entire surface of the chest. When respiration becomes relieved to a degree, a little **turpentine** may be rubbed over the chest walls after the skin has been thoroughly dried, and a **kaolin** or other plastic dressing should be applied and well covered, and hot water bottles or a rubber water bag should be placed outside of this. The position of the patient should be frequently changed to avoid hypostatic congestion. As the temperature rises and characteristic fever develops, the use of **aconite** in small doses, with belladonna, is important. **Bryonia**, with small doses of **arnica**, in the proportion of ten drops of the former with five drops of the latter, in a three-ounce mixture, a teaspoonful every hour, will be of great service; later, **asclepias tuberosa**, and small doses of **sanguinaria** or **ippecac**, will serve to rapidly ameliorate the symptoms. Other remedies which will find a place in the hands of the careful prescriber are **sticta lycopos**, and in an occasional case **lobelia**. The use of stimulants, more or less freely, will be demanded in certain of the cases, and occasionally better results will be obtained from frequent small doses of **atropin** than from belladonna. The **strychnin arsenate** will be found exceedingly useful during convalescence.

PULMONARY CONGESTION, PASSIVE.

Synonyms:—Passive hyperemia.

Definition:—A pulmonary congestion, which occurs secondarily to other conditions and which may have existed for a long time. This condition exists as a result of some obstruction which prevents the proper return of the blood into the left side of the heart. The most common cause is probably mitral disease. It may occur also from the pressure of an abnormal growth, and also results occasionally from asphyxia.

A form of congestion, known as **hypostatic congestion**, occurs in the dependent portions of the lungs, where there has been feeble action of the heart, in chronic disease with much debility, especially in the aged, and also where long-continued fevers have induced great debility; also where, from paralysis, tuberculosis or chronic rheumatic arthritis, the patient has been permitted or obliged to long occupy the same position. This is sometimes known as **hypostatic pneumonia**, or **pulmonary splenization**.

Symptoms:—The condition is of slow development, in marked distinction to acute hyperemia; there is some cyanosis, first of the lips and subsequently of the face; usually there is no marked difficulty of breathing, but the patient is inclined to breath with the mouth open. There is an increase in the rapidity of the respiration also, but the character of the pulse depends much upon the underlying condition. Physical examination shows the absence of the respiratory murmur, increasing consolidation, and later, bronchial breathing, with mucus rales.

Treatment:—The position of the patient should be frequently changed, the original position not being resumed for a long time. The medicinal treatment must be adapted to the cause of the disease. Usually minute doses of **belladonna**, frequently repeated, even in the most feeble patients, will be of service. Small, frequent portions of the infusion of **capsicum** will produce excellent results. **Cac-**

tus *grandiflora* will render service also, and *avena sativa* if there is paralysis; well selected tonics and restoratives will be demanded. Usually the underlying conditions are incurable, and a permanent influence from medicine cannot be expected.

PULMONARY EMBOLISM.

Synonyms:—Pulmonary infarction; hemorrhagic infarction.

Definition:—A hemorrhage within the interstitial structure of the lung with no destruction of lung tissue.

Etiology:—An embolus, usually from valvular disease of the heart, ultimately within the pulmonary artery, occluding one of its branches, is the cause of this disease. Conforming to the branching and distribution of the artery the consolidation will be wedge-shaped in character, with its base against the pleura and its apex pointing upward and into the structure of the lung. Infarction takes place also from extensive capillary engorgement and stasis. Rupture of an abscess will occlude the pulmonary artery or its branches and permanently block the circulation and exclude the air from all pulmonary cells within the area of the distribution of the occluded branches.

Symptomatology:—The immediate occlusion of a smaller branch of the pulmonary artery will be followed at once by difficult and rapid breathing, pain in the region of the disorder, dizziness, fainting, cough, with the expectoration of a small quantity of blood or bloody mucus, ultimately, perhaps, delirium and convulsions. When a main branch of the artery is obstructed, death may be sudden and almost unannounced, as in some cases of heart disease. The pulse is rapid, small, feeble at first, but will increase in strength as the acute symptoms subside in a favorable manner.

Diagnosis:—It is difficult often to positively determine the existence of this condition. The sudden extreme pain

in the chest, with no previous injury, the bloody expectoration, with fainting and sudden prostration, are all diagnostic. The pain and unconsciousness occurring together are not present usually in other conditions. The conspicuous physical sign is that of a sharply outlined consolidation.

Treatment:—Specific measures are hardly available. The same measures should be adopted with the patient as are suggested in pulmonary apoplexy. The pain must be relieved, and treatment directed to the cause of the difficulty. Subsequent treatment must be directed to the conditions as they arise, and every effort should be made to effect an absorption of the obstruction. If the area of consolidation is not too great, benefit will accrue from a careful management of the case.

PULMONARY EDEMA.

Synonyms:—Edema of the lungs; *hydrops-pulmonum*; dropsy of the lungs.

Definition:—A condition characterized by a serous effusion into the minute structure of the lungs, resulting in occlusion of the air vesicles and smaller bronchioles.

Etiology:—The condition is usually secondary to pulmonary congestion. It also follows acute inflammation of the pulmonary structures and is present also as a sequel to chronic disease of the heart, Bright's disease, diabetes, chronic liver disorder and some forms of anemia. It may be present also in the last stages of protracted infectious disease and in chronic alcoholism.

Symptomatology:—With the infiltration of the serum and consequent encroachment upon the air cells there is pronounced **difficulty in breathing**, which may increase rapidly. **Cyanosis** appears early, with persistent, irritating cough; secretion is free, and the sputum is frothy and streaked with blood. It is so tenacious as to often obstruct

the larynx, resulting in threatened **suffocation**. While the pulse is increased and becomes rapid and feeble, there is usually no elevation of the temperature, it being inclined rather to become sub-normal. As the condition increases, **cyanosis** develops, **asphyxia** occurs and death follows.

Diagnosis:—It may usually be distinguished by the presence of chronic conditions, from which it may develop. Inflammatory conditions will be accompanied by fever and hydrothorax will exhibit characteristic physical signs.

Prognosis:—If the condition follows in the line of the progress of general dropsy, especially if that condition depends upon disease of the heart, death may occur very suddenly; if it is an attendant of acute inflammatory conditions and its approach is announced by previous symptoms, or is anticipated, the treatment will correct the condition and prevent serious development.

Treatment:—The condition demands prompt treatment, with a full appreciation of its seriousness. Active derivative medication is sometimes demanded; a mild hydragogue cathartic, as **magnesium sulphate**, may be given, or mild doses of **apocynum**. This agent is especially adapted to this condition, as it antagonizes congestion, stimulates and strengthens the action of the heart, and promotes absorption or dissipation of the effusion. **Bryonia** will act in harmony with this remedy, and the two combined or alternated should produce the best of results in cases amenable to treatment.

Where the case is of sudden development and immediate asphyxia threatens, dry cups over the chest, both anteriorly and posteriorly, will postpone a serious result until other measures can be made effective. **Phosphorus** given in small doses will be of benefit also in this condition. **Quebracho** will temporarily relieve the difficulty of breathing, and in mild cases should produce permanent benefit.

PULMONARY EMPHYSEMA.

Synonym:—Vesicular emphysema.

Definition:—A condition in which air has found its way into the pulmonary interstitial tissue from rupture of the air cells. More correctly this definition applies to that form of emphysema known as interlobular. The term vesicular emphysema is applied to that form of the disease in which there is a dilatation of the air vesicles or a rupture of the vesicular walls permitting the coalescence of a number of cells, forming bladder-like air spaces or air sacs.

The interlobular form is sometimes known as interstitial or intervesicular emphysema. Vesicular emphysema is divided by some writers into three sub-classes—the hypertrophic, or large-lunged form; the atrophic or senile emphysema, and compensatory emphysema, which form is induced by the inability of the lung cells in proximity to the diseased area because of some obstruction or from compression, to expand properly.

The interstitial form is always acute. The compensatory form may be either acute or chronic, while the hypertrophic and atrophic forms are always chronic. This condition changes the contour of the chest, increasing its size and inducing from projection forward the so-called barrel-shaped chest.

Etiology:—The condition depends essentially upon an underlying constitutional depravity, from which the tissues lack vital tone and lose their characteristic elasticity. The immediate cause may be a muscular strain or a direct blow to the chest walls.

Treatment:—There is no specific method of cure for this disease. Occasionally, benefit is obtained from the use of the ammonium chlorid, or from a carefully selected iodid. Specific bronchial symptoms may demand *belladonna*, *bryonia*, *sticta*, *sanguinaria* or *lobelia*. The patient should reside in a dry climate.

PULMONARY ABSCESS.

When from severe, persistent inflammation pus forms in any portion of the lung structure, with the consequent destruction of the tissue, the condition known as abscess of the lung occurs. Large abscesses are not common, but not infrequently small abscesses in one or more portions of the lung structure may occur at the same time. Or pus corpuscles may become infiltrated into the bronchi, blood vessels, or interstitial tissue. These may diffuse themselves through an entire lobe, or there may be a restricting fibrous wall, enclosing the purulent fluid. The pus may penetrate into the bronchioles and be expectorated through the bronchial tubes, evacuating the entire abscess, or it may perforate the pleura and fill the pleural sac.

Symptomatology:—The hectic fever, slight cough and increasing feebleness are similar to the same conditions existing in other subacute diseases of the lungs. The physical signs, the results of an exploratory puncture, or the presence of pus cells in the expectoration, are indisputable evidences. The symptoms are so similar to those of purulent bronchitis, or bronchiectasis, that the diagnosis is sometimes difficult. In all protracted cases of inflammatory disease in the chest the physician should keep the possibility of septic infection ever in mind and should recognize the characteristic symptoms immediately they appear.

Treatment:—If the presence of pus in considerable quantity near the surface of the lung can be positively determined an opening should be made through the chest wall and through the pleura, with possibly resection of a portion of a rib, and the purulent fluid should be thoroughly evacuated. The use of the same remedies advised in the treatment of gangrene of the lungs will result in good in these cases. The same thorough course of tonics and restoratives must also be prescribed. Judicious exercise, with deep inspiration, must be carefully carried out during the latter stages of convalescence. If there is any pul-

monary condition, in which alcoholic stimulation is admissible, it is in the treatment of gangrene or abscess of the lungs. The use of internal antiseptics and antiseptic inhalations is also important.

PULMONARY GANGRENE.

Gangrene of the lungs may be circumscribed in character, or it may be uniformly diffused, in which case the entire lung or usually the larger portion of a single lobe will become converted into a disorganized, greenish, black, or colored, pulpy mass, with a most offensive odor. In the circumscribed form there are evidences of inflammation in the contiguous lung structures, with the natural products of such action filling the air cells and minute bronchi. A portion of the lung structure will break down, become darkened in color and emit an offensive odor. In this form a distinct line of demarcation is present, and abscess formation or a slough occurs, and the offensive dead tissue is expectorated, mixed with blood and the secretion from the bronchial tubes. If the diseased area is not too large recovery will take place, the cavity will be walled off from the healthy tissue and ultimately there will be some contraction of the wall, which will to a large extent close the cavity, especially if the diseased area is contiguous to the pleura. If the pleura should be perforated in the progress of the disease, the dead tissue, with the accompanying offensive fluid, will be thrown into the pleural sac, resulting in empyema, with the probability of immediate systemic infection.

Etiology:—The condition results from a pulmonary embolus or as the result of active circumscribed inflammation. It is more liable to occur after croupous pneumonia than after bronchopneumonia. It may be caused also by the inhalation of a foreign substance into the bronchial

tubes, from an injury or blow to the chest walls or other traumatism. The condition is a rare one and seldom attacks females.

Symptomatology:—Usually cough has been present from previous conditions, and is not attributed to the possibility of the occurrence of gangrene, until the expectoration becomes much more abundant, darker in character and exceedingly offensive in odor. Simultaneously with the appearance of this odor is rapidly increasing prostration, a cool sweat, a rapid, feeble and easily compressed pulse, and at first a low temperature, which is followed by rigors and rapidly increasing temperature as soon as infection occurs; there is rapid breathing, which is often greatly oppressed, the cough increasing and becoming persistent. This is due in some cases to the fact that the purulent fluid induces a severe bronchitis from its irritating properties.

When a quantity of the sputum is collected and allowed to stand in a test tube or beaker it separates into three distinct layers; the upper layer is grayish green or yellowish green in color, opaque and frothy; the middle layer is almost clear, of watery appearance or resembling saliva, slightly turbid; the lowest layer is a brownish heavy sediment, consisting of a mixture of the greenish gray, disintegrated lung substance, cells and dark, grumous blood in small quantities.

Prognosis:—These cases usually appearing after the patient has become greatly debilitated from previous severe and protracted disease are apt to result fatally. It is only when they appear early, are distinctly circumscribed or involve a small portion of the lung tissue, that life may be saved. Surgical methods can be applied in the less severe cases with satisfactory results.

Treatment:—In a certain proportion of the cases of severe disease of the lung gangrene should be anticipated, and remedies given which will prevent it, or the formation of an embolus and the necrosis of lung tissue. This can be done to an extent by the use of *echinacea* or *calcium*

sulphide or by the use of the **iodids**, and the judicious use of stimulants only when stimulants are needed. The inhalation of volatile antiseptics and the internal use of **creosote** or small doses of **turpentine** will be exceedingly beneficial. Careful attention must be paid to the nutrition of the patient. Concentrated foods of a highly nutritious character should be given in small quantities at short intervals and the normal functional operation of the digestive apparatus, maintained, through the influence upon the nervous system and upon the glandular structure of the organs themselves of **hydrastis canadensis**, **nux vomica**, **collinsonia** or other bitter tonics and **xanthoxylum** as stimulants.

PNEUMONOCOONIOSIS.

This condition is present only under those circumstances where there is persistent continued inhalation of dust of some form. A deposit takes place in the air cells of the lung and a low grade of inflammation is induced, with the consequent results of such an inflammation or a chronic form of bronchitis may be induced, or emphysema or necrosis of lung tissues from ulceration.

Symptomatology:—The symptoms are gradual **emaciation**, a persistent, irritating **cough**, distress in the chest, with shallow and difficult breathing, ultimately the **spitting of blood**, and an offensive breath. **The expectoration**, upon careful inspection, will show the presence of particles of dust, in a mucopurulent fluid, tinged with blood.

Diagnosis:—The diagnosis is made from the knowledge of the patient's constant environment and by the exclusion of those causes and associated conditions with the characteristic phenomena of other diseases of the lungs and bronchial tubes.

Treatment:—No specific suggestions can be made as to the medicinal treatment. The patient must be removed en-

tirely from all conditions involved in the production of the disease and the attendant phenomena must be treated symptomatically. Much attention should be paid to building up the system and to the restoration of the normal tone of every function of the body.

HEMOPTYSIS.

Synonyms:—Hemorrhage from the lungs; spitting blood; bronchial hemorrhage; bronchorrhagia.

Definition:—The expectoration or coughing up of small quantities of blood from the respiratory structures. It may be from the mucous lining of the bronchial tubes, from the bronchioles or from an ulcerating surface in the lung structure contiguous to cavities in tuberculosis.

Etiology:—This condition is an accompaniment of phthisis. It follows acute pulmonary congestion, from whatever cause, and small particles of blood are found in the expectoration of pneumonia. It may follow direct injury to the chest walls and any wound of the lung structure. Excessive physical exercise induces it, as well as the inhalation of irritating vapors and hot air. In croupous pneumonia there is actual capillary rupture as a cause of slight hemorrhage. The condition may be present also from ulceration in the larynx, trachea or bronchi. It sometimes follows pulmonary congestion, secondarily induced, by serious disease of the heart, and it occurs from blood dyscrasia, and rarely as a complication in acute infectious disease.

Symptomatology:—The first appearance is that of a small quantity of blood coughed up. It may be mixed with saliva and the usual expectoration, or there may be a warm, salty taste in the mouth, with only a slight paroxysm of coughing, when a small quantity of bright, frothy blood will be spit out of the mouth. The blood is not clotted in pulmonary hemorrhage. While the quantity is usually

very small there is often a flush of heat over the body, some slight palpitation, vertigo and weakness, with momentarily increased respiration. The pulse is apt to be rapid, soft and compressible. When the quantity is larger there is actual shock and prostration, out of proportion to the amount lost. In extreme and rare cases a small mouthful of blood may be coughed up at one time, and the hemorrhage may continue in repeatedly coughed up particles for some hours. With this there is extreme pallor, coldness of the extremities, cold sweat, great weakness, anxiety or alarm, vertigo, rapid breathing and a feeble and usually a very rapid pulse. This may be followed by fever and a mild form of delirium or by restlessness and sometimes nervous excitability.

In the late stages of phthisis, where there are large cavities, the blood may escape into a cavity and all the constitutional symptoms of hemorrhage appear, with no blood, or but little blood in the expectoration. This has resulted in death, a blood clot being found upon post-mortem to fill a large cavity.

Diagnosis:—The condition of the blood, as named above—frothy, in small quantity, bright colored, not clotted, with constitutional symptoms out of proportion to the amount of blood lost—all distinguish pulmonary hemorrhage.

It is distinguished from nasal hemorrhage by the larger quantity of blood, in the latter case, which is venous, dark in character usually and occurs in a steady flow or in drops, when from the nose. Cough may be induced by this blood entering the larynx, but the quantity and dark color determine its source. In hemorrhage from the stomach there is nausea and vomiting of a large quantity of blood mixed with the stomach contents.

Prognosis:—The condition is one of more or less gravity in the prognosis of the disease, which underlies it. But while it causes alarm, anxiety, fear and apprehension it seldom causes death.

Treatment:—Perfect quiet and rest must be enjoined, and if the face is flushed, the skin hot and the patient excitable, **cooling applications** to the head, or the bathing of the face and neck and hands in cold water will be beneficial. If the patient is chilly and the skin cool or cold, with cold extremities, a **hot foot bath** or hot drinks will be necessary. Mild stimulants internally may be needed if there is sudden prostration. If the stomach was not previously disordered I give at once a half teaspoonful of the tincture of **erigeron** and **cinnamon**, made by dissolving a dram each of the oils of erigeron and cinnamon in two ounces of officially dilute alcohol. This is given in an ounce of cold water and may be repeated in half an hour if necessary. This will have an immediate effect, but it cannot be long persisted in, as it may produce disorder of the stomach. Ten grains of **gallic acid** may be given soon after the above medicine is given, and this should be repeated every two hours until the tendency to hemorrhage has long passed. **Ergot** is a prompt remedy in its hemostatic influence, but its depressing influence upon the general circulation contraindicates its use in the markedly congestive types, with impairment of the capillary circulation.

Diseases of the Pleura.

PLEURITIS.

Synonym:—Pleurisy.

Definition:—An inflammation of common occurrence, involving the parietal and visceral layers of the pleura.

The disease may be acute, subacute or chronic, and it is divided, in its various forms of manifestation, into (1) dry, fibrinous or plastic pleurisy, which is the usual form of acute pleurisy. (2) Sero-fibrinous pleurisy—pleurisy with effusion, usually sub-acute in character. (3) Purulent pleurisy or empyema—suppurative pleurisy—and, (4) adhesive pleurisy—pleuritic adhesion—chronic pleuritis.

Etiology:—The disease occurs in the early part of the winter and in the late winter or early spring, as the exciting cause is cold and sudden temperature changes. Although it occurs at any period of life, it is most common in early middle life, and to the male sex, because of their more frequent exposure. As it follows many forms of acute and infectious disease, its occurrence under these circumstances depends to an extent upon the occurrence of those diseases and upon the causes which induce them.

The cause of the disease is micro-organisms. These may be the pneumococcus—the diplococcus of pneumonia—the various pyogenic organisms, the bacillus tuberculosis, the typhoid bacillus or the specific bacillus of various other diseases. The immediate exciting cause is exposure to cold, traumatism or the presence of other inflammatory disease, either specific or non-specific in character.

ACUTE PLEURISY.

Synonyms:—Acute plastic pleurisy; dry pleurisy; dry fibrinous pleurisy.

Etiology:—It is seldom that pleurisy occurs, as an idiopathic disease, in a patient previously of good health, presenting no premonitory symptoms. This, however, is the typical presentation of acute pleurisy. It occurs from exposure to extreme cold or to a sudden change from warm weather to a cold and very damp spell. It occurs also as the result of a direct blow upon the chest walls or other mechanical injury.

The condition may occur secondarily to other acute diseases of the lungs, bronchial tubes or other contiguous organs. It is dependent also upon acute rheumatism, upon various neuroses and it accompanies pulmonary tuberculosis.

In this form of the disease there is not that copious effusion that is present where there is purulency, but as a result of the engorgement of the pleural membrane there is a diffused but slight fibrinous exudate. This induces a roughness of the serous surface, which is the immediate cause of the acute pain, as it interferes with the normal movement between the parietal and visceral surfaces of the pleura, unless the disease is prolonged and severe, there is no great quantity of exudate and firm adhesion does not take place.

Symptomatology:—The disease is inaugurated with the occurrence almost simultaneously, of a **chill**, a severe, sharp, cutting, lancinating **pain** in the side, an abrupt **rise in the temperature**, and usually a **severe cough** which greatly aggravates the pain. There are but few, if any, premonitory symptoms. **The pain** is intermittent in character at first, occurring only on inspiration or upon movement. The patient is inclined to hold the affected side with the hand and lean toward that side to prevent movement and muscular tension. **The respiration** is short, irregular

or broken, cut short by the pain. There is a dry cough, which is restrained with every possible effort, because it increases pain. The face is pale and anxious, and the patient soon shows signs of severe illness. The pulse is small, hard and quite rapid; from one hundred to one hundred and twenty-five. The temperature in a typical case will not usually exceed 102.5° F.

While these symptoms are those of an average case of acute pleurisy the symptoms will vary from those so mild in character as not to interfere with the patient's work, receiving but little attention, to an extreme manifestation with severe chill, high temperature, unbearable pain and rapid prostration.

Diagnosis:—The sudden occurrence of the acute pain, which interferes so materially with the inspiration, is the important diagnostic factor in this condition. The restriction of the affected side, in motion or in breathing, some dulness on percussion, the friction sounds or fine rales that are present on auscultation, will all distinguish this disease from intercostal neuralgia, as well as the chill and fever, which are not present in neuralgia.

In muscular rheumatism the pain and soreness are in the muscles alone and are not influenced to so great an extent by the respiration. The condition is distinguished from pneumonia by the progressive development of the latter disease, by the character of the cough and expectoration, by the chest signs and by the severity of the constitutional symptoms in pneumonia.

Prognosis:—When this condition occurs in an uncomplicated form it is not by any means a dangerous one, as nearly all cases recover. It lasts from three to twenty days. But a severe attack renders the patient liable to subsequent attacks. And if the condition is not at once aborted, the results of the inflammatory action, such as thickening, roughness of the serous surfaces or adhesions, may occur and may become more or less permanent and

thus interfere to a material extent with normal chest expansion and the oxidation of the blood.

Treatment:—The patient should be put immediately to bed and absolute quiet enjoined. A **mustard plaster** should be prepared from freshly ground mustard mixed with warm water, to form a thin paste. A little of the white of an egg may be added to prevent blistering, but if the poultice be carefully watched blistering will not occur. The mixture should be spread over a piece of thin cloth sufficiently large to cover the entire affected side. This should be laid upon a hot plate, carried to the bedside and transferred directly to the painful area, covering the larger portion of the affected side. This should be kept very warm from four to eight minutes, occasionally turning down a corner of the poultice to observe the redness of the skin. When the skin is thoroughly reddened the poultice should be removed and an application made of sweet oil or vaseline, the chest very warmly covered and the painful area kept hot with a rubber water bag or hot water bottles.

If the mustard poultice be large enough and of good strength the pain is entirely relieved for the time being. Later, if the pain returns, the chest walls may be strapped much after the manner adopted in the treatment of a fractured rib, passing the straps horizontally around the body across the ribs from the spine to the breast bone, each overlapping the other. However, if strapping is not done and the pain returns, another sharp mustard poultice may be applied for a few minutes from twelve to eighteen hours later, if the surface was not previously blistered.

Our most specific remedies in pleurisy are **bryonia**, **asclepias** and **aconite**. Bryonia seems to have a specific selective action for the pleural membrane. When given immediately at the onset it inhibits the outpour of an exudation, overcomes the local congestion, relieves the pain, controls the fever and terminates the condition within a very few days, leaving no apparent results of the acute inflammatory action and to a limited extent fortifying the patient against

subsequent attacks. At the onset of the attack the indications for **aconite** are present—the dry, hot skin, sharp, hard, quick, rapid pulse, with restlessness—the two remedies may be given in conjunction or alternately; by so doing a more immediate result will be obtained. From three to five drops of specific aconite in four ounces of water and from ten to fifteen drops of specific bryonia in four ounces of water should be given in teaspoonful doses every half hour or hour. If there be no inclination to the return of the pain, bryonia alone will be sufficient. Those physicians who are not familiar with the comprehensive action of bryonia use aconite and **asclepias tuberosa**. From five to ten drops of the specific asclepias may be given every hour until the skin is moist and the symptoms abate, when it may be given every two or three hours. Any practitioner who uses these remedies with confidence will not return to the action of opium in pleurisy, as this course is in every way superior. There is, however, an exceptional case, occasionally, in which the pain and soreness and consequent impediment to the respiration will continue and persist. In this case, if opium be used at all, one, two or three doses of five grains of the **diaphoretic powder** or of **Dovers powder** may be given, or half of a dram of the deodorized tincture of opium may be added to two ounces of water and a teaspoonful of this may be given every hour, for a few doses, when there will be some relief from the pain and the remedy may be gradually withdrawn, dependence being placed upon the specific remedy. The influence of opiates in large doses is in line with the underlying pathological elements involved in the development of the disease, and the remedy should be avoided entirely if possible.

Acute pleurisy occurs sometimes with slight elevation of the temperature only, but with pronounced chill, cold extremities and moist, cool skin, the patient being dull or somewhat apathetic and indifferent. In such a case **bella-donna** must be administered in sufficient dosage to exercise its physiological influence within the course of from

four to six hours, this will antagonize the congestive tendency of the disease and will greatly promote the ultimate cure. It may be continued in smaller doses for perhaps forty-eight hours if no contraindications present.

When with a sharp onset of the disease there is considerable nervous excitability, with restlessness, dry, hot skin, bright eyes with contracted pupils, and continued motion, *gelsemium* will accomplish very satisfactory results. It may be given instead of *aconite* and alternated with *bryonia*. During convalescence the patient must avoid exposure and the breathing of cold air and must keep the chest well protected.

SUB-ACUTE PLEURISY.

Synonyms:—Pleurisy with effusion; sero-fibrinous pleurisy.

Etiology:—This form of pleurisy is usually secondary to other inflammatory conditions. When resulting from cold it is induced by prolonged exposure and dampness or by working in the water or in wet clothes in the cold. It may also follow an injury to the chest wall, developing somewhat slowly, not appearing until several days after the injury. It is not an uncommon sequel to acute articular rheumatism and will also occur during the course of the infectious diseases, of pericarditis or of pneumonia. It is a most common complication of pulmonary consumption, being readily induced in those of a tubercular diathesis.

Symptomatology:—The disease may occur as a primary condition idiopathically, but it develops more slowly than the dry form with premonitory symptoms. In other cases a pain in the pleura may have been present for a number of weeks, slowly increasing in severity, restricting the breathing, but not sufficiently severe to attract the attention of the physician. It may have been taken for rheumatism or neuralgia, or may be thought to be the result of a local injury. Thus insidious in its development, the dis-

ease is fully developed before a careful examination reveals its actual character.

There is but little **fever** in this form. It is scarcely perceptible in the day time, but increases in the early evening to perhaps 101.5° F. and continues during the night. **The pulse** is soft and compressible during the day, but increased in rapidity, is hard and perhaps wiry during the increase of the temperature. **Cough** is apt to occur early before the character of the condition is discovered. The patient will remark, as with movement and deep breathing, that there is invariably a sharp increase of the local pain upon every effort of coughing. From the first he **loses strength** and becomes **emaciated**. The face is pale and anxious, there is **anorexia**, **constipation**, **insomnia** and increasing **lassitude** and indisposition. As the effusion develops the patient leans toward the affected side; when walking, may continue to press his hand against that side, and will invariably lie on that side when sleeping.

Upon **inspection** the physician will observe the position of the patient, the decrease of movement on the affected side upon breathing, and the increase of respiratory action on the unaffected side. Later there will be a distention of the spaces between the ribs, and increased dulness or flatness on percussion over the affected area; the area of dulness may be changed by changing the position of the patient, unless, as may be the case later in the disease, the effusion be circumscribed by adhesions.

With the full development of the disease the breathing is embarrassed, always painful, especially the inspiration, which is often cut short by the pain, as in the acute form. The breathing is rapid and shallow, materially interfering with proper oxygenation of the blood. Where the effusion develops rapidly, until there is a large quantity, so great is the obstruction to the breathing that cyanosis may develop. With this condition the patient becomes very restless, **the respiration** is rapid and shallow, **the pulse** is small, feeble, exceedingly rapid and easily compressible, **the skin**

will become cool, and in exaggerated cases death seems imminent.

Subacute pleurisy may last from two to four weeks, or it may become chronic in character. Usually after perhaps twenty-one days the temperature declines to the normal point, the pain is diminished and there are evidences of the absorption of the effusion. These evidences are a reduction in the size of the chest walls, a gradual restoration of the respiratory movement and a decrease in the bulging in the intercostal spaces. As convalescence progresses an apparent reduction in the size of the affected area to less than normal is apparent, and as the patient walks, it will be found that he leans naturally toward the diseased side, carrying the shoulder and the arm a little lower than usual. This, however, may not be a permanent deformity. It will be overcome as the normal condition of the chest is obtained and upon the return of vigorous health.

While we have narrated the facts concerning a slow or gradual development of the pleuritic effusion it is not uncommon to find evidences of a mild exudation only, which may be present for some days, when, with considerable rapidity, the pleural cavity becomes filled to distention with the effusion, with a correspondingly sudden development of all of the concomitant symptoms. With this the disease assumes a severe and dangerous type, and unless the effusion is removed by surgical means, death may occur suddenly.

Diagnosis:—While it is not difficult usually to determine the presence of a fluid in the pleural cavity, there are cases in which a positive diagnosis of this disease is not readily made. It is necessary also to determine at once concerning an effusion, whether it be serous, purulent or sero-purulent. The dulness present must be distinguished from hepatization of the lung, from interstitial inflammation, as in pneumonia, from the various forms of pulmonary congestion, and from the dulness of tubercular conditions. The character of the development of the disease, a history of the

previous existence of some condition that could induce it, the presence of the characteristic pain of pleurisy, which is permanent in its location, with the character of the breathing and the subsequent evidences of a slowly increasing effusion, point unmistakably to the presence of this form of the disease.

Prognosis:—The prognosis as to a total ultimate recovery is fairly good. There is a tendency, as has been stated, for the condition to become chronic, and if this occurs, changes take place which are not readily relieved by any measures. A sudden and rapid increase of the effusion is an alarming symptom and greatly increases the danger. If the underlying cause is incurable in character, as when the disease follows Bright's disease, syphilis and tuberculosis, but little, of course, will be accomplished in the treatment of the pleuritis.

Treatment:—The indications for specific treatment at the onset of this condition are somewhat similar to those of a dry form of the disease. The pain will suggest the necessity for the use of *asclepias tuberosa*, which the author has given in fifteen-minim doses every two hours with excellent results. This will increase the secretions of the skin materially and will facilitate the normal respiratory function, encouraging constant oxygenation. Later, as fever develops, the indications for *bryonia* will appear distinctly. This remedy should be given for its influence in retarding effusion until the pain has materially abated and the cough has decreased. To promote absorption of the fluid we have several remedies of value. If there be indications that rheumatism may be present within the system in any form, or that a rheumatic diathesis exists, the **salicylate of sodium** in from five to ten grain doses may be given every two hours for several days.

If there are evidences of exhaustion, with nervous weakness or feebleness of the heart's action, especially if any actual disease of the heart may be present, with feebleness, **apocynum** will exercise an actively restraining in-

fluence upon the increase of the exudation and will ultimately assist in its removal. The use of small doses of the **sulphate of magnesium**, as perhaps twenty grains every three or four hours, will be beneficial also.

The depleting measures advised by the faculty have been proven by the experience of eclectic physicians not only to be greatly inferior to the persistent action of correctly adjusted remedies, but to be positively harmful and often productive of serious results. When distention of the chest is conspicuous, the character of the fluid should be examined. This may be done by the use of an ordinary hypodermic syringe having a needle of sufficiently large caliber to permit the passage of small masses of pus cells or coagulated fibrin, in case these be present. If serous in character a portion only of the liquid should be drawn through an aspirator, the needle being introduced between the fifth and sixth or between the sixth and seventh ribs, corresponding with the locality of the fluid, a low dependent portion being selected. It is not necessary that the entire cavity be evacuated when serum alone is present; in fact, there are some objections that may be imposed against its complete evacuation. Absorption of the remaining fluid may take place with facility, after pressure is in part withdrawn from the lungs, and from the circulation in the blood vessels and lymphatics. We do not advise the withdrawal of any quantity of the serous fluid when but a small quantity is present. It is only when it acts as an impediment to the respiration or circulation that it need be reduced in quantity. Pus, of course, demands immediate removal and thorough irrigation of the cavity from which it was withdrawn.

The general condition of the patient must have constant and careful attention, the nervous system must be sustained by well selected tonics, the condition of the digestion and food appropriation must be constantly watched and the patient nourished to the fullest extent. The use of alteratives is beneficial, as the blood is apt to become

quickly impaired, the red corpuscles diminishing and the white corpuscles increasing in number. When the fever has disappeared or is declining an excellent tonic is the **quinin bisulphate** in two-grain doses every three hours. It seems to have a special selective influence in its tonic operations upon the respiratory organs, antagonizing pathological conditions of whatever form and restoring normal functional action. The salt is in every way preferable to the sulphate. If with the pleuritic involvement there be much cough, with bronchial irritation or actual consolidation of lung structure, the dose named should be given with one-fourth of a grain of powdered **ipécac** every two of three hours. To this may be added one grain of the precipitated **carbonate of iron** if there is apparent anemia, or if it seems necessary to increase the red blood corpuscles to promote a more perfect oxygenation. If the general nutrition is impaired, with enfeeblement of the stomach and appropriative organs, **nux vomica** and **hydrastis canadensis** are demanded. These remedies are of essential importance in general restoration and in the upbuilding of the patient and will usually cover the larger portion of the indications for treatment. Some authors lay great stress upon **iodin** in the final restoration of these cases. The agent will be of much advantage in an occasional case, but it should not be looked upon as one of wide influence. It may be given as the **potassium iodid** or in small doses of the compound **tincture of iodin**, or the syrup of the **iodid of iron** may be administered. The recently prepared **iodo-neucleoid** is a most serviceable form, constituting as it does an organic iodin.

The surroundings of the patient must receive attention. The patient should be removed to a warm climate if the condition has been very severe, and should have persistent but correctly adjusted out-of-door exercise. The food should be of a concentrated and highly nutritious character and its immediate appropriation should be encouraged either by partial predigestion or by the use of artificial

digestives. The patient should be taught to increase the respiratory power by the exercise of the lungs, in regular deep breathing or by the practice of a regular system of respiratory gymnastics, not too severe in character.

EMPHYEMA.

Synonyms:—Purulent pleurisy; pleuritis with purulent effusion.

Definition:—A condition of sub-acute or chronic pleurisy, in which, from the characteristic micro-organisms present, pus develops in the pleural cavity instead of or in conjunction with the serous or sero-fibrinous effusion.

Etiology:—Various micro-organisms are found present in the purulent fluid of empyema. The condition develops where the system has become reduced and devitalized, or where there have been pronounced blood changes. It is seldom that the condition follows an uncomplicated case of dry pleurisy, but as a sequel of the sub-acute form of pleurisy it occurs in a large per cent of cases which have not had previous good care. It may occur also where aspiration—thoracentesis—has not been aseptically performed. It occurs secondarily to infectious diseases, to other forms of pleuritis, and is especially liable to occur after pyemia or septicemia. In cases of protracted inflammation of the lungs abscesses form, which may open into the pleural sac, or tubercular cavities may perforate the structure of the pleura and discharge their contents, from which pus rapidly develops. Penetrating wounds of the chest walls or external injuries which result in inflammation of the pleura, and extensive burns, may cause this condition.

Symptomatology:—The development of pus in the plural sac is ushered in with symptoms similar to those present from the formation and absorption of pus in any locality. There is a sudden **rise of temperature**, with a sharp **chill**, or with persistent chilliness. The pain in the affected side which, in a case of previous pleurisy, may have almost en-

tirely abated, increases rapidly, until it becomes very severe. There is rapidly increasing **difficulty in breathing**, often with incessant cough, which greatly exaggerates the pain. The fever quickly assumes a hectic form, with night sweats and rapidly increasing prostration. Emaciation follows and paleness to extreme pallor develops.

The physical signs are those of serous effusion. It must be borne in mind that in some few cases the pus forms slowly and may be walled off or separated from the surrounding tissues—ensacculated as it were—under which circumstances the constitutional symptoms may be delayed or may develop slowly. As the **emaciation** progresses the distention of the intercostal spaces appears much more conspicuous than is apparent in ordinary cases of serous effusion. If **gangrene** be present with the pyemic condition, or if the empyema is greatly prolonged, symptoms of destruction of the blood corpuscles are apparent, closely resembling those of typhoid fever, with dry mucous membranes, dark red in color, a long, thin, pointed tongue, coated with a dark brown or black coat and sordes.

Diagnosis:—The character of the symptoms named in almost every case, preceded by some other severe disease, render the diagnosis not difficult. The use of the exploratory puncture with a hypodermic needle, described under serous effusion, will confirm the diagnosis.

Treatment:—The treatment of the attendant conditions will be conducted in the line of rational adjustment of specific measures as suggested in the other forms of pleuritis. The free drainage of the pleural sac and its subsequent irrigation are demanded. In children much caution should be used in irrigation and in the character of the fluid used. The warm physiological **salt solution** is the safest of irrigating fluids. A ten per cent solution of the **peroxide of hydrogen**, prepared when used, has been very successful with the author. **Carbolic acid** is useful, but there is much danger of its being used too strong. A 1-to-3000 to a 1-to-5000 solution is as strong as should be used

with children. The author has used a solution of the **permanganate of potassium** in extreme cases, followed by warm sterilized water.

In cases greatly prostrated the evacuation of the chest should be conducted with much care. Stimulants should be used hypodermically before the operation, and hot water bottles and persistent stimulation should follow the operation. The most active measures should be conducted for the restoration of the patient, as the condition is even more severe than is often present after surgical operations, or with profound prostration from other exhausting disease. From the first evidence of infection **echinacea** or other carefully selected remedy calculated to antagonize the formation of pus and its influence upon the system, should be persistently used.

ADHESIVE PLEURISY.

Synonym:—Chronic pleurisy.

Definition:—When the pleura is affected by a chronic inflammation in the various layers of its structure, adhesion usually takes place ultimately and consequent permanent change in the structure of these tissues. There may or may not be an exudate accompanying the chronic inflammation, and the condition may follow the sub-acute form of the disease in which there has been a free exudation.

Symptomatology:—The condition is one of long duration and the symptoms are by no means conspicuous. There is a **sense of constriction** in the diseased area, with almost constant dull pain. The breathing is interfered with and there is a dry, harsh, hacking cough, which the patient endeavors to control. Movement increases the pain and muscular effort increases the cough; there is but little if any expectoration, but quite frequently there is bronchial hemorrhage. Usually there is but little effusion.

Treatment:—Specific indications are not marked in this condition, yet they should be diligently looked for and met

with exactness and precision. The suggestions made for treatment during the convalescence of patients who have suffered from other forms of pleurisy should be followed with great care in these cases, immediate effort being made to **restore** the vital **tone** of the patient, to **improve** the function of the **gastro intestinal** tract, to stimulate nutrition and to encourage the full development of the functional action of the lungs and respiratory apparatus. The author has obtained good results from the occasional use of **counter irritation** over the diseased area. Out of door exercise in mild weather and deep breathing systematically performed are very important.

PNEUMOTHORAX.

Definition:—This condition is one in which air has found its way into the pleural cavity. It is seldom, however, that air is found in the plural sac without an effusion of serum or without the presence of pus, or both. These conditions, to be correctly expressed, are known as sero or **hydro-pneumothorax**, or **pyo-pneumothorax**. It may follow ulcerative processes which result from severe inflammation, or it may occur as the result of common injury, as puncture of the chest wall or compound fracture of the ribs.

Symptomatology:—The condition usually occurs with suddenness, with pronounced difficulty of breathing, resulting from oppression of the lungs, acute, unbearable pain in the side and quickly developing cyanosis. It is possible for the air to enter the pleural cavity so rapidly, through even a small opening, as to expel the air from one lung completely, causing collapse, profound shock and perhaps sudden death. Usually the progress is not sufficiently rapid to induce such immediately serious symptoms. The respiration becomes progressively shorter, as if there were a great weight upon the chest, the pulse becomes very fast,

small and easily compressible, feeble and thready. While there is usually an increase of fever it often happens that the temperature becomes subnormal, falling to 97° or even 96.5° F. Upon percussion, instead of the dulness of effusion, there is a marked tympanic sound present over the entire distended area. If a fluid is present and the patient is raised into a sitting posture, dulness will be observed, from below upward, in proportion to the quantity of the fluid. The sounds present in a normal condition over the region of the liver, heart or spleen are positively altered by the presence of air, which displaces these organs to a certain extent.

Prognosis:—The condition is always serious and apt to be fatal when following other protracted disease.

Treatment:—For immediate relief, if the diagnosis is positive, the air above any fluid that may be present should be evacuated through a hypodermic needle of small caliber. It will escape with sufficient rapidity, as sudden evacuation could readily be serious. The fluid may be drawn off by aspiration. Other conditions should be treated symptomatically. The indications must be met promptly, and any tendency to collapse or sudden prostration should be treated with active hypodermic stimulation.

Diseases of the Heart and Pericardium.

ACUTE MYOCARDITIS.

Synonym:—Carditis.

Definition:—An inflammation of the muscular structure of the heart.

The name acute parenchymatous myocarditis may be said to refer to an inflammation involving the parenchymatous muscular fibrillae, while the term **interstitial myocarditis** designates an inflammation involving the connective tissues within the structure of the heart walls. This may be diffuse, involving the structure of all or the larger part of the heart, or it may be circumscribed, involving a limited area with degenerative changes and abscess. There may be two or more circumscribed areas involved at the same time. Myocarditis occurs secondarily to some other acute involvement. A primary inflammation of this structure alone has not been recognized.

Etiology:—Acute rheumatic inflammation of the endocardium, or of the pericardium, is the most frequent cause of acute inflammation, both of the parenchymatous and interstitial forms. The disease may also result from an extension of endocarditis or pericarditis, from any primary cause. In endocarditis the vegetations which form on the valves give off particles, which enter the coronary arteries and form emboli, plugging the smaller branches and thus resulting in localized infection and destruction of tissue and ultimate abscesses—a circumscribed interstitial myocarditis.

Symptomatology:—While a profound impression may be made upon the condition of the patient by an involvement of the entire structure of the heart in acute inflammation the local symptoms are usually not sufficient to distinguish the involvement from an acute endocarditis or pericarditis, especially if of the ulcerative type. If a large embolus should enter the coronary artery, death would soon follow. The plainly apparent constitutional symptoms depend upon sudden **weakness of the heart** muscle, which is shown in abrupt and severe cases by a very rapid, feeble, small, easily compressible **pulse**, which, while at first regular, soon becomes irregular and intermittent. The patient becomes at first **very pale**, but soon the face assumes a peculiar hue from venous stasis, and **vomiting** and **syncope** follow. **The respiration** is apt to be shallow and rapid, rather than slow and labored. In cases of less rapid development, or those narrowly circumscribed, the symptoms resemble those of ulcerative endocarditis, or those of simple or sub-acute endocardial inflammation, and the patient may continue about his employment to a limited extent with the evidences of severe heart disease and an occasional attack of angina. Physical examination will reveal a tumultuous heart, with valvular murmurs. It will be observed that the two sounds of the heart have become nearly equal, the usual distinction being abolished. There is progressive feebleness of the heart's action, with corresponding circulatory disturbance.

Prognosis:—Complete recovery never occurs after myocarditis. The diffuse and interstitial forms may result in death in a very short time. The circumscribed form may exist for a considerable length of time, the patient remaining in feeble health. An embolus, from either form, may produce death with but few if any premonitory symptoms.

Treatment:—So similar are the conditions and evidences to those of a severe form of endocarditis that no difference need be recognized in the treatment. Remedies irritating to the heart muscle, as digitalis and strophanthus, must be

avoided, and those which nourish these structures should be prescribed. Prescribe in strict accordance with the specific indications and treat the serious general conditions with a full appreciation of their seriousness.

CHRONIC MYOCARDITIS.

Synonyms:—Fibrous myocarditis; fibroid heart; chronic interstitial myocarditis.

Definition:—Slowly developing structural change in the cardiac interstitial tissue, fibroid in character, inducing ultimate induration.

In this disease there is a replacement of the muscular fibers of the heart by fibrous tissue. The condition results from an inflammation of the small arteries of the heart, resulting in obliteration and diminished blood supply, which at first causes atrophy, more or less complete, of the muscular fibers, and these, as stated, are substituted by fibrous tissue.

Etiology:—These chronic changes result often from or follow the changes that have been induced by an acute pericarditis or endocarditis. They also follow chronic rheumatism, gout and chronic nephritis, prolonged malarial poisoning, diabetes, syphilis and lead poisoning and the influence of other irritating substances, which induce arterial sclerosis. Probably the commonest cause, however, is chronic alcoholism and the use of tobacco.

Symptomatology:—There are no characteristic symptoms or strictly pathognomonic evidences of the chronic form of this disease. Classic cases have been found on post-mortem examination which were not detected during life. Usually, however, it is attended with three phenomena—a characteristic slow pulse, which may beat forty or forty-five beats per minute (brachycardia); angina pectoris, and vertigo and syncope, with pseudo-apoplectic seizures. The

other evidences closely resemble those of fatty degeneration of the heart. Early in the history of this disease there is a sensation of constriction and weight in the precordial region, there is palpitation upon the least exertion and slightly oppressed breathing, which later may become markedly asthmatic, with symptoms of passive congestion of the kidneys and liver; ultimately dropsy may appear, the patient is easily fatigued and avoids exertion. The mental functions are inclined to inactivity and the mind may become dull, the patient forgetful, absent minded and without power of mental concentration. Upon examination of the chest it will be observed that there is slightly labored respiration, that the impulse of the heart is heaving or lifting in character, and slightly displaced downward and to the left in its apex beat. The sounds are muffled and the first and second beat are without apparent distinction in character. There is no great degree of hypertrophy.

Prognosis:—The condition ultimately is fatal. It may be greatly prolonged, however, in cases where the cause is of slow development. In other cases death is of sudden occurrence when serious disease of the heart had not been apprehended.

Treatment:—No specific measures can be suggested. The course of life and the care of the patient and the surroundings should be advised, as in the treatment of any form of chronic progressive degenerative heart disease. It is in cases that show the characteristic phenomena of this form of disease that *crataegus oxyacanthus* has been used with good results. It is like *cactus*, is a nutritional remedy, and improvement of the nutrition of the heart is greatly to be desired. We believe that a long continued use of these remedies, combined with *hydrastis canadensis*, which improves the tonus of the capillary circulation of the heart, and *collinsonia* will at least greatly retard the advancement of this and other forms of degenerative heart trouble. The use of agents that improve the character of the blood and increase its oxygen carrying power is most important.

These are **iron** and **nux vomica**, with **avena sativa**, through its influence on the nerve centers, when there is general debility. The patient should reside in an equable climate, devoid of abrupt changes and where the atmosphere contains the largest possible percentage of oxygen. In fact, the **inhalation of oxygen** in reasonable quantity occasionally will be beneficial. The patient must avoid over-exertion of both mind and body, as well as anxiety and worry, and must attend faithfully to the carrying out of a careful and judiciously selected course of diet. There are systematic courses of exercise, muscular movement or massage laid out by certain specialists which have for their object the removal of all obstruction to the return of the venous blood to the heart and the promotion of free circulation in the arterial capillaries. This has been productive of marked benefit in a number of cases of chronic heart disease, as it at once takes the strain off the heart muscle, and from increased freedom of the circulation promotes a more normal heart action. But these exercises should be conducted with great care in advanced cases.

PERICARDITIS.

Definition:—An inflammation of the serous envelope of the heart—the pericardium—exhibiting under different circumstances the essential phenomena of an acute fibrinous or plastic, serofibrinous or sub-acute inflammation. Other phenomena which are, however, only forms or stages of development of the above named varieties, have been classed as purulent, adhesive or hemorrhagic. The disease seldom occurs as a primary or idiopathic disorder. It is usually secondary to some other inflammation.

Etiology:—No specific micro-organism has yet been shown to be the cause of the disease. Its immediate development may be due to an injury to the chest walls, to

exposure to extreme cold or to severe physical effort, but it is more apt to occur as the sequel of other acute inflammations, as rheumatism, measles, scarlet fever, smallpox, erysipelas or typhoid fever, and it is not infrequently associated with kidney disease and other severe local and constitutional disorders. An extension of the inflammatory action from pleuritis, or pneumonitis, or even from bronchopneumonia, is not uncommon. The disorder is of common occurrence as the result of severe acute rheumatism in boys and young men, observed more frequently in males than in females.

Symptomatology:—The disease usually develops insidiously, during the progress of some other inflammation, and no plainly marked symptoms are apparent until it has passed through the preliminary stages to complete development. Among the first symptoms of its secondary development are **pain** in the left side of the chest and in the left shoulder and arm: **The fever** is not high, **the temperature** rising to about 102.5° F. As effusion develops, there is oppression in the chest, some difficulty in breathing and some palpitation. **The pulse** is not at first irregular, but is rapid, full and quite strong. **Tenderness** over the region of the heart, with some cough, develops in the later stages of the disease, and if the inflammation assumes a purulent form, there is **septic infection**, with **hectic fever** and **chilliness**. If the disease occurs as a primary acute inflammation, idiosyncratically, there may be a sharp initial chill, quite high fever, with **nausea**, **vomiting** and pain in the præcordium, with marked constitutional impairment.

In cases where effusion occurs from the disease the evidences may be very conspicuous. The fever continues and may be increased. There is usually considerable embarrassment of the heart's action, with restriction and oppression of the respiration to a marked difficulty of breathing, with cyanosis, first apparent by blueness of the lips, and subsequently accompanied by an anxious countenance. The voice changes and becomes feeble or distant and

husky, the pulse and the respiration quicker, and there may be some delirium, or even mild coma. These symptoms vary with the quantity of the effusion, being very severe indeed when the effusion is present in an extreme quantity. As the disease abates the fever declines, the respiration is relieved and the anxious countenance disappears. But unless quickly influenced by the treatment the fever increases to hyperpyrexia; there is great restlessness, with active delirium; the pain may be excruciating and the dyspnœa and cyanosis will be extreme, with a very rapid and feeble pulse and great prostration. In an occasional case death will occur very suddenly, sometimes in a most violent manner.

Physical Examination:—Percussion and inspection in the first stages will be negative, except perhaps an increase in the sharpness of the apex beat of the heart may be observed. When effusion occurs there is some bulging and an increased dulness, with diminished respiratory murmur over the præcordium. There is a distinct friction, or rubbing sound, which is quite characteristic at the base of the heart as the disease progresses. This may be heard in the third and also in the fourth and fifth interspaces. This is increased on pressure and decreases on deep inspiration and upon change in the position of the patient.

Where adhesion takes place it will be seen that the area of impulse is enlarged, and that upon systole there is a retraction at the point of the apex beat. Freidreich says: Collapse of the jugular vein is apparent on diastole.

Diagnosis:—The disease may be distinguished from acute endocarditis by the fact that the latter disease has no friction sound, but has a widely diffused blowing murmur and a more rapid and feeble pulse beat. In cardiac enlargement there is an enlarged area of dulness, which, however, does not extend beyond the apex. There are no friction sounds and the apex beat is distinct. In acute pleurisy the sounds are synchronous with the respiratory

movements, and there is acute pain on inspiration or on movement.

Prognosis:—The disease in its acute form will usually run its full course within a few days, but it is so apt to be overlooked until it has fully developed, or until effusion has taken place, that it may become sub-acute, or chronic, and may last for weeks and terminate in permanent hypertrophy and dilatation. When it is caused by a metastasis of a rheumatic inflammation it is amenable to treatment and may terminate within a few days, with but little effusion, which usually is quickly absorbed.

The disease may be complicated with pleuritis, myocarditis or endocarditis, in which case recovery depends somewhat upon the character and progress of the complications. The disease terminates fatally in only a few of the complicated cases, but it often becomes chronic and important and intractable changes, as dilatation and adhesion result, as stated.

Treatment:—The medical treatment will be similar to that of an acute inflammation of any serous membrane. Hot applications over the precordium, persisted in, with **bryonia** and **aconite**, will meet most of the indications. The bryonia indications are especially conspicuous, but aconite given alternately exercises an especial sedative influence upon the circulation within the structures of the heart, and with the influence of bryonia will prevent effusion and adhesion, or will promote absorption of an effusion before adhesion has taken place.

When the pulse is hard, strong and rapid, the skin moist and cool, the face dull or livid at the onset of the disease, in a distinctly sthenic case, **veratrum viride** in minim doses of the tincture every hour will tend to abate the disease. It soothes irritation of the nervous system, dilates the capillaries, reduces the intense arterial tension, promotes ready evacuation of the engorged venous capillaries and reduces the pulse and temperature. This remedy must not be given later than two or three days after the onset of the disease,

nor where the disease occurs during the progress of some other severe inflammation, from which there is debility or structural change.

Bryonia is so specifically a remedy for inflammation of serous membranes that it is directly called for here. It operates upon the circulation within the diseased membrane and does not affect the action of the heart as do aconite and veratrum. It is doubly indicated in acute rheumatic pericarditis.

When the disease develops idiopathically and in a severe form at the onset most active steps should be taken at once to attract the blood to the extremities. A hot mustard foot bath, or sitz bath, with the hands immersed, will be the first measure. This should be followed with dry cups to the chest and over the spinal ganglia, followed by a mustard poultice to the spine. The patient should be put into bed and kept quiet. He should not be allowed to help himself or exercise in any way, the muscular system should be kept at rest and every possible nervous and mental irritation should be removed. Where there is a serofibrinous exudate, bryonia is of especial service if there are little sharp shooting pains in the heart, or if the patient insists upon lying perfectly quiet for fear that movement will increase the condition of the distress. It should be continued through the period of effusion.

In a plainly congestive type of the disease, with difficult breathing, dull, bloated, purplish countenance, dull eyes, dilated pupils, cool, moist skin, cold extremities and feeble pulse, **belladonna** will act most satisfactorily. It should be given for twelve or eighteen hours in active doses, alone, unless the temperature is high, in which case small doses of aconite may be given with it. When the above conditions are all changed, aconite alone, or with bryonia, should then be given, and the belladonna may be withdrawn.

Cactus grandiflorus is of much service in pericarditis, where the disease is the result of some other severe acute prostrating disorder. It is a remedy for asthenia. It

soothes irritation from weakness, increases the nerve tone of the organ and directly and materially improves the actual nutrition of the organ. This the author has proven beyond all doubt. After the first, the sthenic stage, has passed, it can be given in small quantity, with almost any of the other indicated remedies. If there be a circumscribed area of oppression in the chest, or a sense of constriction, or band-like sensation around the chest, it is directly indicated.

Asclepias tuberosa is an important remedy in the first stage of an acute attack. This is especially true if the skin is dry, the mouth dry and parched, with much thirst, with severe chest pains, especially if from sudden and rapid effusion. It should be given in full doses of the specific medicine, or in infusion drunk freely.

To promote absorption of the effusion in the sub-acute or chronic stages, five grains of **sodium salicylate** should be given every two or three hours. This may be continued for two or three weeks. It will favorably affect the muscular structure of the heart, except when greatly enfeebled, and will antagonize all rheumatic conditions most directly. It acts in harmony with **bryonia**. Any deleterious influence upon the stomach should be watched for. The iodids are useful to promote absorption. **Sodium iodid** in full doses, and **phytolacca** given in conjunction, are valuable. I am also favorable to the action of the potassium acetate in small doses five times each day, but this is an auxiliary remedy only. The use of stimulants and tonics is imperative in the protracted cases, and where there has been previous severe prostrating disease I have given **strychnin** in solution, in an elixir of the **glycerophosphates**, or **strychnin** and iron with the **hypophosphates**, in an elixir of **hydrastis canadensis**. Cactus is here valuable because it not only improves the nutrition of the heart, but of the central nervous system. It will give excellent results if combined with **avena sativa**. **Strophanthus** is too irritating to the heart muscle to be given if myocardial inflammation is

present, as is more than likely in many cases. The same objection may be applied to digitalis. When cyanosis, with greatly impaired respiration, rapid, feeble and irregular pulse appears, the use of **quebracho** is important, with **oxygen**, until cardiocentesis can be performed. A hypodermic needle may be inserted through the fourth or the fifth intercostal space, at the margin of the sternum, determined by the apex beat and fluid withdrawn to assure its presence, and determine its character. If purulent it is safer to open the chest wall by free incision and the sac by resection. If serum is present, aspiration may be performed, but the utmost care must be exercised. The mortality in operative cases is above fifty per cent, but when there is a necessity for operation, recovery without it is hopeless.

ADHESIVE PERICARDITIS.

In chronic inflammation of the heart envelope a number of conditions, may finally appear which result in adhesion; and there have been found adhesions upon post-mortem examination, which were not suspected, and where there were no evidences of the heart disease during life. There is a variety of circumstances under which adhesion may occur, as well as variety of manifestations. There may be more or less complete adhesion between the parietal and visceral layers of the pericardium, resulting in the enclosure of the heart in a complete capsule. Or there may be one or more small adhesions between these two layers, or adhesion of small patches of the membrane. Or in case of an extension of an inflammation from the pleura to the pericardium there may be adhesions between the heart and the chest wall. Another form involves adhesion of the two layers to each other and to all contiguous tissues, forming an adhesive mass of the heart and its envelopes.

Symptomatology:—As stated, there may be adhesions in mild cases without sufficient evidences to positively declare them. The symptoms in more pronounced cases are

not always sufficiently clear to enable a positive diagnosis or differential diagnosis to be made. There is always **shortness of breath** and **pain**, but the pain varies; it may be steady and constant, and not necessarily severe, or it may occur in paroxysms, usually after unusual effort, or after mental excitement, or a fit of anger. It may be mistaken in a severe paroxysm for angina pectoris. **The pulse** is rapid and feeble and tension and pressure are greatly reduced, or it may be irregular, and palpitation is of frequent occurrence. As a result of adhesion, the ventricles become dilated and hypertrophy with its concomitant symptoms—dropsy, prostration, vertigo and venous stasis—are all present.

Treatment:—The general condition of the patient should have the most careful and continuous oversight. Life can be greatly prolonged and made pleasant by this care and attention. Effusion should be retarded and its absorption and removal should be promoted by rational measures. When indications for treatment arise, which can be met specifically, they must at once receive prompt attention. **Cactus** will regulate the action of the heart and greatly improve its tone. **Bryonia** will allay irritability and relieve much of the pain and distress in the heart. **Apocynum** will increase the tonicity of the heart, and its nervous structure, acting in harmony with cactus. It will also promote the removal of any serous accumulations. **Echinacea** should be given in large doses for some weeks, especially if pus be present in the sac.

PURULENT AND HEMORRHAGIC PERICARDITIS.

When septic infection occurs during the progress of pericarditis, or when pericarditis occurs as the result of septic infection, the effusion may be sero-purulent or purulent in character. Purulency may follow a sero-fibrinous inflammation as a later and more serious development of the disease. With the purulent effusion some hemorrhage into the sac may occur, and in tuberculosis, and with

some cases of Bright's disease, hemorrhage has occurred when the effusion was serous in character.

Symptomatology:—When pus is present in the sac the effusion is not as great in quantity, usually, as when serum alone is present. There is **hectic fever** and irregularly recurring **chilliness**. There is a small, rapid and feeble **pulse**, quickly becoming irregular. The patient becomes rapidly weaker, especially if **hemorrhage** into the sac occurs. A positive diagnosis can only be made by puncture with a hypodermic needle, and the fluid being examined. The treatment is fully given under pericarditis.

HYDROPERICARDIUM.

Synonyms:—Dropsy of the pericardium.

Definition:—A disease characterized by a transudation of serum into the pericardial sac, when no inflammation of the pericardium exists, in a manner similar to serous transudation into other cavities and tissues from causes common to dropsy.

Etiology:—The condition is a factor of dropsy in general; and a true dropsy of the pericardium. It develops from the same causes and appears late in the course of cardiac and renal dropsy. As it may occur after the appearance of dropsy of the pleura—hydrothorax—the diagnosis of hydropericardium may be rendered difficult and it may be entirely overlooked, as many of the symptoms of this disease are common to hydrothorax. In post-scarlatinal or post-diphtheritic nephritis this form of dropsy may develop suddenly and unaccompanied with other effusions.

Symptomatology:—The symptoms are not dissimilar to those of hydrothorax. There is difficulty in breathing, when the fluid is present in considerable quantity, with oppression of the heart action and general distress. There is precordial pain in a few cases, with irregular heart action, feeble pulse and ultimately cyanosis. The physical signs

are those of dulness on percussion, which changes its location as the position of the patient is changed.

Treatment:—The treatment is similar to that of general dropsy and depends upon the exact cause of the disease. Usually we will find our best remedy to be **apocynum**, because the conditions to which that remedy are best adapted are present, while exercising its general influence upon the dropsical effusion it acts as a specific heart tonic, and regulator.

PNEUMOPERICARDIUM.

Definition:—Air or gas in the pericardium.

Etiology:—Puncture of the pericardium, simultaneously with rupture of the chest wall or lung structure, may result in the admission of air into the pericardial sac. Diseases that produce cavities in the lungs may perforate also the enveloping membrane of the lung and heart, and admit air to this sac. It has also followed pyothorax and gastric ulcer.

Symptomatology:—Pneumopericardium, clinically, does not exist independent of some effusion, either serous, purulent or sanguineous. With the exception that the heart oppression is greater and there is more difficulty of breathing, the symptoms are the same as those of pericarditis, with effusion. The physical signs, however, are of diagnostic value. Instead of diffused dulness there is resonance on percussion over the heart, with occasionally a rasping, crackling metallic friction sound, sometimes known as the “water wheel” sound, resembling the churning or splashing of fluid, due to the commingling of the fluid and gas in the cavity. This, accompanied with marked disturbance of the heart’s action, and increasing feebleness, is a diagnostic indication of much value. It should be distinguished from the fluid sounds present when the fluid content of the large lung cavity is agitated by action of the heart.

Prognosis:—The prognosis is unfavorable. But few cases recover; death usually occurs within a few days.

Treatment:—While the symptoms may be ameliorated by specific measures, the real treatment is purely surgical, and this course must not be resorted to unless conditions are in every way favorable. It is usually only applicable in traumatic cases. Where chronic disease, with ulceration, is the cause of this condition surgical or medicinal measures are of no avail.

HEMOPERICARDIUM.

When the heart is subjected to a direct injury, as a bullet wound, or knife wound, hemorrhage into the pericardial sac may result. Other causes are rupture of the heart from a blow, or from disease of its walls, or from perforation of the sac from the rupture of an aneurism of the aorta, or from rupture of the coronary arteries. The result of this hemorrhage is usually death, but death is not caused by the quantity of blood lost, which is not large, but by compression of the surface of the heart and of the larger veins.

Prognosis:—When the condition occurs from direct injury the chest wall has been opened in a number of cases, the blood clots removed and the injury successfully repaired. When due to the progress of chronic disease it is necessarily fatal.

Symptomatology:—The symptoms are those of heart oppression, difficult respiration, a rapidly failing pulse, progressive cardiac weakness, with other signs of imminent dissolution.

ENDOCARDITIS, ACUTE.

Synonyms:—Simple or benign endocarditis; verrucose endocarditis; papillary endocarditis.

Definition:—An acute inflammation of the membrane which lines the heart, but usually affecting the covering to the valves only, in which case it is designated as **valvular endocarditis**. If it attacks the membrane which covers the walls of the cavities only it is called **mural endocarditis**. Attacking both, it may be called **valvulo-mural** or **general endocarditis**.

Etiology:—No specific micro-organism has as yet been discovered as the invariable cause of this disease. In the vegetations that result from its progress the usual pyogenic organisms, with those found present in rheumatism, typhoid fever, influenza, pneumonia and tuberculosis, have been found present. Rheumatism is the most common cause of the disease. Thirty-five per cent of the cases in adults, and from sixty-five to seventy-five per cent in childhood are induced by this disease.

The severity of this disease is not always in proportion to the severity of the attack of rheumatism, a severe case of which may present no endocardial symptoms, while a very mild attack may be followed by severe and even fatal endocarditis.

As rheumatism seems to be associated with tonsilitis, so this disease may follow tonsilitis, even when rheumatic symptoms are not conspicuous. The disease is a common complication of all the eruptive fevers, especially of measles and scarlet fever, also of diphtheria, typhoid fever and specific fevers. It will follow local inflammation of the other structures within the thorax, as pneumonitis, pleuritis and pericarditis and myocarditis. The disease is also associated with certain nervous disturbance, notably with chorea. In this case the evidences of valvular disease are often present, existing in perhaps one-third of the protracted cases, and as it is not uncommon for chorea to be

associated with a rheumatic diathesis the endocardial disease may have been caused by the rheumatism also.

Symptomatology:—The subjective symptoms of this disease are not distinctly marked. If fever has been present there will be an increase of temperature and the pulse will become more rapid, small and compressible. Pain over the heart is seldom present, but the patient may complain of pain in the left shoulder and arm. In any disease which may be followed by heart complications this symptom should be regarded with suspicion, and the heart should be subjected to the closest scrutiny and the patient should be kept very quiet. As the disease progresses, if the patient is moving around or at all active, palpitation, difficult breathing and perhaps some conspicuous evidences of heart weakness will soon appear.

While mitral or aortic murmurs do not prove the presence of endocarditis, their presence with the above named symptoms is a suspicious indication, although there are mild cases in which there are no valvular sounds, especially in the mural form of the disease.

While the pulse is usually more rapid and feeble, the heart impulse is increased, as may be readily seen upon inspection of the chest walls. Later, if the disease involves the myocardium, the impulse will be greatly lessened. There is no increase of the area of heart dulness, unless from the progress of the disease there is dilatation.

Upon auscultation it will be found that the heart sound is considerably prolonged, especially if rheumatism is the exciting cause of the disorder, and the systolic murmur over the mitral valve is mild and blowing in character. With these mitral sounds there may be a distinct regurgitative murmur over the aortic orifice, but in an occasional case only.

Diagnosis:—There are no pathognomonic phenomena that point unmistakably to this disease; the diagnosis must depend upon the presence or absence of the symptoms above named. A knowledge of pre-existing condi-

tions which may cause the disease, and of the fact that endocarditis is by far the most frequent of heart complications of other acute disorders, will suggest its probable presence when heart symptoms appear. A sudden rise of the temperature, with valvular murmurs, not previously observed, are the symptoms to be depended upon.

Prognosis:—Except when ulceration occurs or unless this disease depends upon the previous existence of some serious malady, death seldom occurs as an immediate result. The disease, however, quickly becomes chronic and the changes which are produced in the endocardium or in the valves it covers, and consequent interference with the normal functional action of the heart, will result in structural changes, which ultimately result in death.

Treatment:—When acute disease, especially rheumatism or the exanthemata exist, which may result in endocarditis, the utmost care should be exercised to prevent the occurrence of so serious a complication. As overtaxation of the heart will bring it on, all exercise of any kind should be prohibited, the patient should be kept quietly in bed, a mild transpiration from the skin should be encouraged and sudden cold, draught or anything that would even temporarily suppress the secretions must be sedulously guarded against. The bowels should be kept in a mildly soluble condition, free action from the kidneys should be maintained and acidity of the stomach and intestinal tract should be guarded against. It is the author's opinion that many of these cases can be prevented if close attention be paid to elimination, and no morbid matter be allowed to accumulate within the system, as there is no doubt that autotoxemia is a common underlying cause of the disease.

When the first symptoms of heart lesion occur, especially with children, the **utmost quiet** must be **enjoined**, as violent exertion may result seriously with these patients.

In selecting the remedies particularly adapted to the cure of this disorder the cause must be borne in mind as well as the fact that inflammatory process must be arrested

without depression. If there is no marked asthenia a very excellent combination in the first stage is that of **aconite** and **bryonia**. These two remedies can be given conjointly, but in very small doses frequently repeated. They act directly upon the inflamed membrane, as they would upon the pericardium or upon the pleura. **Asclepias** and small doses of the **potassium acetate** may be given at the same time to promote elimination, which, as has been stated, is of the utmost importance. If the disease is a sequel of rheumatism **bryonia** is especially indicated and will serve a double purpose. The **salicylate of sodium** or **lithium** may be given with benefit at the same time, or these agents may be given alternately or even in combination in properly adjusted dosages in rheumatic cases. If, however, there is marked feebleness, as when the disease follows a severe case of scarlet fever, diphtheria or measles, a remedy must be given which will act as a sedative to the heart's action and temperature, and will yet increase the strength and power of the heart. Paradoxical as this may seem this can be readily done with **cactus**, or if effusion has taken place into other tissues, with **apocynum**, but these remedies will not act satisfactorily where there is a marked sthenic condition or temporary exaltation of the nerve force. If congestive phenomena elsewhere are present, **belladonna** may be combined with **cactus** most satisfactorily. The author treated a typical case of endocarditis in a young man twenty years of age who was recovering from double pneumonia, which in its turn had been induced by a severe protracted case of measles, with recession of the eruption. When called, the temperature had risen very suddenly, the difficulty of breathing was most distressing, the face was bloated and dusky, with pronounced cyanosis. The head was thrown back to facilitate the respiration, and the pulse was so rapid that it was impossible to count it. Death seemed imminent. Hot applications were immediately applied to the chest, and a mixture of ten minims of the fluid extract of **belladonna** with thirty minims of **cactus** in four ounces of water

was prepared and administered every half hour or hour. The result of this simple treatment, which on the author's part was something of an experiment at that time, seemed almost miraculous. When the next call was made fourteen hours later, the precordial oppression was relieved, the pulse was beating regularly at one hundred and twenty, soft and full, the bloated and discolored condition of the face had disappeared and the respiration was comparatively easy. This plan of treatment was persisted in with subsequent use of other remedies, as suggested, and although convalescence was greatly protracted, the patient ultimately recovered.

If the condition progresses favorably and the temperature abates, the heart may be supported by remedies that influence the nerve centers without irritating the heart muscle. These are *avena sativa*, the *strychnin arsenate* and *hydrastis canadensis*, which at the same time improves the gastro-intestinal functions, promoting the appropriation of food and encouraging general nutrition. *Digitalis* and *strophanthus* should not be given, as their influence is largely upon the fibrillæ of the heart muscle, acting as irritants rather than exercising a soothing and nutritional influence.

The indications for treatment, further than those just named, will be similar to the indications in pericarditis, and should be met with the same remedies. There are times when counter-irritation should be advantageous, but this is only auxiliary. For anemia and subsequent prostration judiciously selected tonics should be administered, and food should be selected with the utmost care, that will be easily digested and readily appropriated.

ULCERATIVE ENDOCARDITIS.

Definition:—This form of endocarditis is distinguished from the benign form just described by the fact that ulceration may occur as the result of inflammatory action, with possible suppuration, or these conditions occur when no previous endocarditis was known to have existed. From this ulceration there may be destruction of valvular tissue or perforation of a valve or perforation of the ventricular septum. While it is possible that the disease may occur independently of any previous inflammation it is not probable that it does so occur, except perhaps in extremely isolated cases.

Etiology:—The ulcerative form occurs more commonly as a secondary infection, from the micro-organisms of acute infectious disorders, such as scarlet fever, diphtheria, erysipelas, measles, smallpox, typhoid fever, tuberculosis, chorea, chronic nephritis or gonorrhea. The micro-organism would thus depend largely upon the primary disease.

Symptomatology:—The symptoms are no more conspicuous usually than in the benign form of the disease. There may be no elevation of the temperature above that which has previously existed, from the primary disease, or the temperature may have fallen to normal and show no increase upon the occurrence of ulceration. Constitutional symptoms similar to those that occur in typhoid conditions, or in acute septicemia, may develop, with some cerebral manifestations. There is usually persistent chilliness, with erratic fever, and occasionally sweating occurs. There is suppression of the secretions, the tongue becomes dry, thin and pointed and usually coated in the center with a dark brown or black coat, with sordes on the teeth. If these typhoid symptoms develop there will be a persistently high temperature, with but slight remissions occurring irregularly; there will be tympanites, gastro-intestinal irritation, with diarrhea, enlargement of the spleen, with ten-

derness on pressure and acute, lancinating pains, with delirium of a mild type and scanty urine.

If malarial toxemia co-exists there will be marked remissions in the temperature at regular intervals, with perhaps chilliness also occurring periodically and slowly developing anemia. In other cases there may be renal complications or marked cerebral manifestations, which may be mistaken for some of the forms of meningitis.

The local symptoms are usually not conspicuous, pain in the heart, oppression of breathing, irregularity of the heart's action or violent action may be either present or all absent. Usually there are valvular sounds, which are more or less distinctive; there is a plain murmur on systole, and the second sound of the heart is somewhat increased in force. There may be signs of local pulmonary consolidation.

Diagnosis:—This depends upon the previous existing conditions and is usually unsatisfactory, as there are so few distinctive phenomena. Exclusion should be made of pericarditis and of the infectious diseases without ulceration. If previous benign endocarditis has existed, or if the symptoms of this disease are present during the course of severe infectious disease, and all the phenomena, especially those of the heart, become greatly aggravated, endocardial ulceration will probably be present.

Treatment:—The suggestions for treatment which are found present in pericarditis and in endocarditis of a benign form will apply in this case, with the addition of our most positive measures to antagonize septic infection and the development of pus. These are **echinacea** in full doses, with the use of **calcium sulphide**, to partial saturation. The supportive treatment should be most carefully selected and of the most vigorous type. Stimulants may be given when prostration is marked. It must be borne in mind that the condition is a very serious one, and the treatment must be constitutional rather than local. Other alteratives may be selected according to the judgment of the physician.

CHRONIC ENDOCARDITIS.

This condition occurs as the natural result of a protracted case of the acute benign form. In other cases it develops slowly and insidiously without previous known cause. The patient may be suffering from lead poisoning, from some local tubercular infection, from chronic kidney disorder, usually from Bright's disease, although it may be present with diabetes, or it may be associated with arteriosclerosis. Probably the commonest cause is a rheumatic diathesis, which will develop early in life and last through a period of years. While the patient is still young it will be observed that there is a mild form of heart disease, which develops slowly with valvular incompetency, and at times some slight pain over the heart. The symptoms may be slightly exaggerated by those factors which increase the rheumatic manifestations. The condition is ultimately proven to be chronic endocarditis.

Treatment:—The treatment of the disease is symptomatic, largely depending upon the underlying cause, and should be carried out for a long period, as the disease is usually fully developed before it is discovered. The treatment will seldom be curative. Palliation, however, is possible and the progress of the disease may be temporarily arrested. The measures adopted will be in every way the same as those suggested in the treatment of valvular disease.

CARDIAC HYPERTROPHY.

Synonym:—Enlargement of the heart.

Definition:—An organic change in the heart, characterized by an increase in the growth or development of the muscular fibers of the heart, which results in an actual enlargement of the entire organ. When this occurs without any enlargement of the chambers of the heart, which result from dilatation, the condition is known as **simple hypertrophy**. When with the increase in muscular tissue there is also a dilatation of the cavities of the heart it is known as **eccentric hypertrophy**, a condition in which the organ is usually much larger than in simple hypertrophy.

This abnormal growth may affect uniformly the entire structure of the heart (general hypertrophy), or it may affect one side of the heart, or one chamber of the heart only. A very rare condition may exist in which, from overgrowth of muscular structure, without dilatation, the chambers of the heart are reduced in size. This has been called **concentric hypertrophy**, though the term is seldom used and with many clinicians the existence of the condition is denied.

The enlargement of the heart occurs more frequently in the left ventricle, as an understanding of the exercise of its function would naturally suggest. Next in frequency is the right auricle.

Etiology:—The condition usually follows valvular disease of the heart, or other obstruction, to the arterial circulation, which results in overwork of the heart muscles, and in pericardial adhesions. Obstructions to free arterial circulation are a narrowing of the lumen of the aorta, aneurism, external compression, as from a tumor, and fibrosis. The condition is an accompaniment of chronic pulmonary disease also, such as emphysema and tuberculosis.

An idiopathic hypertrophy may be found present in men whose constant occupation demands great physical exer-

cise or prolonged, violent muscular exertion, as woodmen, blacksmiths, teamsters, draymen and professional athletes. The excessive use of stimulating beverages, such as tea, coffee and alcoholic liquors, are common causes.

Symptomatology:—The symptoms of simple hypertrophy are those of increased and forcible heart action (sthenic heart). There may be at first no abnormal symptoms. This is especially true when there is sufficient compensation. Later, as the condition progresses, the force of the heart in its apex beat is conspicuous and produces some distress. The capillaries of the skin, especially those of the face, are very full, the face is flushed on every exertion and the eyes are slightly bulging; the pulsation of the carotids is plainly apparent, the pulse is hard, but not necessarily accelerated, is very full, bounding and resistant to pressure. These symptoms are followed by palpitation on exertion, persistent pain, although not necessarily severe in the precordial region, with vertigo, headache, tinnitus aurium and light flashes before the eyes.

This forcible condition of the circulation may rupture sclerosed vessels, resulting in cerebral, or pulmonary apoplexy, and in hemorrhage from the nose or from the lungs.

Where eccentric hypertrophy exists the sthenic symptoms are not so pronounced. There are evidences of valvular inefficiency, the pulse is feebler and more rapid, soft and more readily compressible. Later there is progressive debility, the difficult breathing is accompanied with cough, or actual bronchial catarrh, with short breathing, may be apparent. With the possible occurrence of hemorrhage from the lungs, under these circumstances, an erroneous diagnosis is likely to be made, but the correct condition is confirmed in the later stages by the appearance of cyanosis and general edema.

Treatment:—In the early stage of simple hypertrophy there is but little doubt that a gradual change in occupation and the use judiciously of certain of the heart sed-

atives will retard or control entirely the progress of the disease. The patient should positively refrain from stimulants of every kind and the exclusion for a limited time of nitrogen from the food will materially assist in preventing abnormal muscular development. Both **aconite** and **veratrum** will exercise an influence upon the heart muscle which will retard the development of the disease. **Ergot** will not only produce contraction of the capillaries within the organ itself, but it will prevent the cerebral symptoms and reduce nervous and high arterial tension. The use of small doses of the **iodides** in conjunction with full doses of the **bromide of potassium**, theoretically speaking, should be of much service. In the early stages of eccentric hypertrophy a careful adoption of the above measures and the use of **gelsemium** will be serviceable. It will be well also to study the specific heart remedies with reference to their exact adaptation to the conditions as they appear and to the specific indications.

DILATATION OF THE HEART.

Definition:—An expansion of the chambers of the heart from actual stretching of the walls, resulting in the enlargement of the entire organ. It will be seen that the distinction between dilatation and hypertrophy is a clear one, as in the latter case the enlargement is due to an actual increase in the amount of structural tissue of the organ. At the same time, it is possible the two conditions may exist together, and a diagnosis calculated to distinguish how far either condition is involved in the enlargement may be impossible. In simple dilatation, the walls do not materially decrease in thickness, but the cavities of the heart are enlarged. In hypertrophic dilatation, as has been defined, the cavities enlarge and the walls increase in thickness. In atrophic dilatation the cavities are enlarged and the walls of the heart become thin un-

til in some cases they seem hardly able to exercise the necessary pressure upon the contained volume of blood.

The amount of dilatation may be uniform or it may involve one of the auricles or one of the ventricles only, or there may be dilatation of all the cavities, but considerable variation as to the amount of dilatation.

Etiology:—Anything that obstructs the circulation persistently will induce dilatation. The commonest cause probably is aortic constriction which directly increases the intra-ventricular pressure and dilates the walls of the left ventricle. The increase of pressure, of course, is neutralized by the compensatory hypertrophy, but the nutrition of the muscular structure of the walls is materially interfered with. The condition is also brought about by excessive muscular exercise, as by athletics, bicycling and mountain climbing and among school children by jumping the rope. The author has observed it among bicyclists who were inordinate cigarette smokers.

The dilatation occurs in many cases where disease has weakened the walls of the heart, which may occur from various forms of exanthematous disease where endocarditis has resulted, or from rheumatism, as also from pericarditis, or myocarditis. The degenerative changes in the structure of the heart result in dilatation. Chronic gastritis or other chronic disorder of the gastro-intestinal tract, if not corrected by appropriate treatment, may be followed by dilatation.

Symptomatology:—The disease may appear with considerable suddenness after extreme muscular exercise, or heart symptoms may appear as a result, after some days or weeks perhaps, have elapsed, when an examination will show **dilatation**. If the symptoms have not prevented farther exercise, the dilatation may be progressive. Usually the dilatation is insidious and gradual, extending over a considerable period of time. The common symptoms are **distress** over the heart or in the chest, palpitation readily induced by increased effort, rapidly increasing **difficulty**

in breathing, cold extremities and cold skin. The heart beats with increasing rapidity, and the apex beat is notably feeble. Over the tricuspid valves there is distinct murmur in systole. Venous pulsation in the neck is one of the apparent evidences of this condition. The pulse is feeble, rapid and irregular.

Diagnosis:—When there has been previous inflammation, it is difficult to distinguish between the organic murmurs and those which this condition has induced. With hypertrophy there is increased energy in the heart's action, with dilatation there is feebleness; with hypertrophy there is a slow, full round, regular pulse that resists compression; with dilatation there is a small rapid, soft, feeble pulse, easily compressible; with simple hypertrophy there is cerebral fulness, excitability of the circulation of the brain with throbbing carotids; with dilatation there may be no unusual fulness of the cerebral circulation, or anemia may exist with apparent pulsation in the veins of the neck.

Prognosis:—If the conditions are diagnosed early and all the factors are taken in hand at once, the patient's life may be prolonged many years. The author has under observation a case which was induced by prolonged violent dancing, developing within a short time more than twenty-six years ago. With a full appreciation of the character and danger of the condition a course of life was laid out for the young man which he has carried out with no violation during the entire time. There was no apparent increase in the dilatation for perhaps fifteen years, but during the past ten years the evidences have become slowly more marked and the valvular sounds much more distinct, the dilatation seems to be uniform. The prognosis as to recovery is not good.

Treatment:—In simple cases the use of pure heart tonics which exercise their influence, devoid of any stimulation, are to be selected. The patient must avoid excitement of whatever character, must eat plain, easily digested and highly nutritious food, must control all inclination to

anger, and must avoid anxiety and worry. He must be placed in the most favorable environment possible. Agents calculated to produce an improved tone of the nervous system and to encourage the digestion and appropriation of nutrition are all essential.

FATTY HEART.

Considered pathologically there are three distinct conditions that must be considered under this head: (1) **Fatty overgrowth**, (2) **fatty infiltration**, (3) **fatty degeneration**. By most writers the first and second are considered together, as they usually intermingle, as one seldom exists without the other. For the sake of clearness I adopt the classification of Leyden, and I will consider them as distinct pathologic conditions.

FATTY OVERGROWTH.

Definition:—This condition is an increase in the deposition of sub-pericardial fat, until an excessive amount is deposited around the heart, forming an envelope, which may measure from an inch to an inch and a half in thickness. This abnormal accumulation seriously compresses the heart and materially interferes with its action.

Etiology:—It is a concomitant of general obesity and usually results from abnormal and slowly increasing corpulency.

Symptomatology:—The symptoms are mainly those of a weak heart in an obese patient. From compression of the heart the muscular fibers undergo atrophy and from reduced contractile power greatly weaken the force of the heart's action. Any sudden violent effort produces general distress, dizziness, difficult breathing, palpitation, capillary stasis or cyanosis and fainting. The condition is found present in those who are indolent and are extravagant in

their habits in eating and drinking, especially those who consume a large quantity of beer. The physical signs are largely negative, owing to general obesity, all the sounds are muffled and weak, the pulse, however, is usually regular in beat, although occasionally intermittent. It is weak, easily compressible, usually large and soft.

Treatment:—The treatment depends upon the reduction of the general obesity and the results are not encouraging in advanced cases. If the fatty overgrowth has not induced changes in the heart structure the prognosis is favorable. There will be no indications found for specific treatment. Any course advised to reduce the fat should not lower the vital tone of the system, reduce the general strength or impair the health of the patient. *Phytolacca decandra*, in conjunction with *collinsonia* or *hydrastis*, will be found to produce good results. The use of bladder wrack is suggested in this disease when there is general torpidity of the system, with extreme inactivity and muscular relaxation. The iodids have exercised a beneficial influence in a number of cases.

FATTY INFILTRATION.

This term designates a condition which differs from both overgrowth and fatty degeneration in that there is a deposit or infiltration of fat cells between the muscular fibers in the myocardium. This may be associated with fatty overgrowth; in fact, is seldom found alone. The muscular fibers are not changed in character except when prolonged compression results in atrophy.

Symptomatology:—So closely is this condition allied to fatty overgrowth—it being dependent upon much the same conditions—that it is practically impossible to distinguish between them during life. In this condition there is apt to be dilatation of the heart and irregularity of its action. The immediate symptoms are sudden and severe exhaustion from the least violent muscular exercise, vertigo, palpitation, asthmatic breathing, syncope and great distress in the

precordial region, amounting soon to **angina**. While some hypertrophy is always present it cannot be distinguished in the presence of fatty overgrowth.

Prognosis:—A judiciously conducted course of treatment will ameliorate the symptoms in some cases, or at least postpone a fatal issue. A complete cure is seldom accomplished.

Treatment:—The course of treatment is the same as that advised for fatty overgrowth, with the additional suggestion that possible changes in the heart structure may demand the use of **cactus** to promote an improved nutrition of that organ.

FATTY DEGENERATION.

Definition:—In this disease the fat cells actually replace the structural elements of the muscular fiber, the fiber being converted into fat, at first perhaps in part only, but ultimately throughout the entire length of the fiber. The condition may be located in a restricted portion of the heart wall, or there may be a number of affected areas. In extreme cases it is almost universal, producing a friable or a greatly softened condition of the organ.

Etiology:—The condition follows obstruction of the coronary arteries when there is a tendency within the system to a general deposit of fat. It is common among alcoholics and in patients suffering from some forms of Bright's disease, especially chronic interstitial nephritis. It is also present in persistent anemia, especially in the pernicious type, and where the oxygen-carrying power of the blood is greatly impaired. In general tuberculosis in the cancerous cachexy and in phosphorus poisoning. It is often present in cardiac hypertrophy and may occur more or less rapidly in cases of acute infectious disease, which are greatly prolonged. The difficulty occurs more frequently among males than among females, and is seldom found in patients under forty-five years of age.

Symptomatology:—In the early stage of either form of fatty heart a specific diagnosis is exceedingly difficult. With degeneration, however, dilatation, because of pronounced muscular weakness, begins early and its phenomena will soon appear. With this there is also a cool or cold skin and cold extremities. The patient is irritable and suffers from mental depression and despondency. The dilatation, which may not be apparent even after other marked heart symptoms are present, may, from unusual violent muscular exertion, become greatly increased at once with a train of alarming and distressing symptoms. Usually, however, dilatation occurs more slowly with a gradual development of characteristic symptoms. There is extreme palpitation, with faintness, described as a sensation of smothering around the heart, dizziness and difficult breathing. The symptoms of quickly occurring breathlessness on little exertion, with a tendency to faint, are common symptoms of fatty degeneration. While the heart is usually feeble and compressible in character it does not generally become irregular or intermittent until in an advanced stage of the disease. Brachycardia, however, is very apt to exist, the pulse running as slow as from thirty-five to fifty per minute. It is not uncommon in a class of these cases for a patient to become mentally deranged or to exhibit delusional insanity. In the later stage of the disease there are apoplectic or pseudo apoplectic attacks, associated usually with Cheyne-Stokes breathing, or a mild form of epilepsy may occur. Auscultation gives no pronounced evidences, the heart sounds are very feeble, the first sound being almost inaudible.

Prognosis:—These cases do not recover. Death may follow slight muscular exertion, or it may occur with no premonitory symptoms. A patient who has been conversing from his chair but a moment before may be observed to suddenly show violent facial contortion, with a painful effort at respiration, a clutching at something with the hands, staring of the eyes, purplish countenance, and death,

or he may be, as is commonly the case, found dead in his bed in the morning.

Treatment:—To prevent fatty degeneration the strictest attention should be paid to the conditions which underly it, and constitutional measures should be adopted for its prevention. Every apparent dyscrasia must be promptly corrected, anemia must be overcome and a full normal quantity of red corpuscles must be restored. This will necessitate the use of our best tonics and restoratives under the most favorable hygienic conditions. If dilatation is apparent early, before the muscle fiber has actually degenerated, the use of remedies to inhibit further dilatation and put the muscle in the best possible tone, is highly essential. *Hydrastis* and *cactus* and *digitalis*, the former to sustain the nutrition of the heart, and the latter to exercise a contracting influence upon the muscular fibrillæ and thus prevent further dilatation, are important remedies. *Strophanthus* in small doses will act similar to *digitalis* in this influence. *Collinsonia* and also *crataegus* are important remedies in this condition. They should be given with confidence and persisted in.

Diseases of the Valves.

AORTIC INSUFFICIENCY.

Synonyms:—Aortic incompetency; aortic regurgitation.

Definition:—A condition in which the valve of the aorta fails to completely retain the blood which has been forced into it from the ventricle—fails to prevent the return of the blood into the ventricle. There may be an eroded condition of the valve; it may be torn or perforated by ulceration or the segments may be hard from calcification, or they may be shrunken. There is a consequent regurgitation of the blood into the ventricle during diastole, when that chamber is receiving the blood from the left auricle. As a result the ventricle is greatly overdistended, and in time dilatation results.

Etiology:—There are a number of factors which will induce this condition; one of the causes is muscular strain, resulting from excessive muscular action. This condition is found among athletes, and is sometimes called the athletic heart. During the bicycle craze a few years ago it was found in a number of cases. Another cause is dilatation of the aortic orifice from which the valves are too small to close. There is a failure of approximation. The presence of uric acid in inducing chronic changes through irritation of the lining of the heart and of the aorta, is undoubtedly a cause more common than is generally recognized. Other irritants are alcohol within the blood and foreign irritating substances, as lead in chronic lead poisoning. The condition occurs more commonly perhaps in males than in females, because of their occupation.

Symptomatology:—There is a visible **pulsation** of the **vessels of the head**, neck and upper extremities, which increases as the condition advances, until a general throbbing throughout the entire body is induced. This occurs when the compensatory hypertrophy of the left ventricle is no longer sufficient to overcome the injurious consequences of the defect in the valves. Prior to this time there are but few evidences of the disease. These symptoms are especially aggravated or exaggerated by the least excess of muscular activity or by some mental excitement, anger or extreme sorrow. With the general pulsation there is a throbbing **headache**, **tinnitus aurium** and **vertigo**, with flashes of light before the eyes, or distorted vision; or **dizziness** is especially conspicuous upon sudden rising from a recumbent position. There is difficulty in breathing, or shortness of breath, a general sense of uncertainty and lack of assurance, with usually much apprehension.

As the condition progresses, changes take place in the character and distribution of the blood; one of the first results of which is **cerebral anæmia**, and ultimately arteriosclerosis. The face exhibits a peculiar pallor, although there are times when it is flushed with heat. There are hot flashes, general in character, and there is a sensation of oppression in the region of the heart, with sometimes a cord-like or band-like sensation around the chest. There may be an entire absence of **pain**, although it is not uncommon that there is some distress constantly present, and occasionally there is a genuine attack of angina. Pains radiating from the heart to the left shoulder and extending down the upper arm frequently occur and it is not uncommon to treat these pains as if they were rheumatic in character.

In the later stages of the disease, when compensatory hypertrophy has ceased, the **distress** of the patient becomes exaggerated. He is obliged to sleep in a sitting posture, and must avoid all physical exercise. He becomes **extremely pale**, almost pallid, and in an occasional case the face becomes **cyanotic**. The effort the patient makes at breathing

in advanced stages is most distressing to the observer. As these symptoms develop, the mind is apt to give way. There are hallucinations, delusional insanity and strong suicidal tendencies. This is probably due to the improper supply of blood to the brain, as well as to the influence of the toxins, which result from inadequacy of the renal and other excretory organs.

The influence of the condition upon arterial tension induces perverted action of the large glandular organs. Positive congestion of the liver induces chronic hypertrophy. Structural changes in the kidneys occur, and from either or both of these conditions **dropsy** is induced. General anasarca is uncommon, edema only of the feet and hands being usually observed. Among the physical signs is the general pulsation we have referred to, and the possibility of a capillary pulsation in the lower lip, as seen in the changing shades of color in the mucous membrane. This capillary pulsation is designated as **Quincke's pulse**, and can be also seen under the nails. There is a characteristic lateral pulse beat, which is induced by the elongation or straightening of the blood vessels, which is called the **water-hammer pulse**, or **Corrigan's pulse**. This pulse is a characteristic symptoms at all times. There is a short, quick impulse to the finger, which immediately disappears, as if the artery had collapsed, the blood receding abruptly. When this pulse becomes weak, as it does when the disease progresses, it becomes a serious diagnostic symptom, denoting threatened cardiac failure. Upon auscultation at the sternal end of the second intercostal space, there will be heard in its greatest intensity a diastolic murmur which will be transmitted downward toward the apex of the heart. The area of dulness is gradually increased, extending to at least three inches below the nipple, and sometimes being observable at the right edge of the sternum. The aortic regurgitant murmur is distinct in the fourth left intercostal space, or in the so-called aortic area at the second right costal cartilage. When this sound is greatly exaggerated

it will be conveyed by the chest structure to any part of the chest. There is at times a sharp systolic sound, which can be heard through the stethoscope in any of the large superficial arteries, which is known as the pistol-shot sound. This is due to abrupt filling of the vessels with blood, and is strictly local in character.

Diagnosis:—The correct diagnosis cannot always be made in this important condition, but when the diastolic murmur is pronounced, and the characteristic Corrigan pulse, as above described, is found present, with pronounced enlargement of the left ventricle, as determined by the physical signs named, a correct diagnosis is unquestionable. The peculiar throbbing sensations named are also of assistance in determining the character of the lesion. The regurgitant murmur above referred to varies with different patients, of course, and it also varies at different times in the same patient. At one examination it will barely be distinguished, while at another time, or upon change of position, or after excitement or active physical exercise, it may be very conspicuous.

Prognosis:—In all forms of valvular diseases of the heart there are none more likely to induce sudden death with no premonitory symptoms than this; however, with many cases, especially those who are conscious of the condition and who consequently exercise great care for their own welfare, life is prolonged a number of years, although it is rare that a patient exceeds ten years. Where dropsy or other serious conditions are induced by the presence of the aortic lesion, death occurs sooner. The patient who suffers from dissipation will yield more readily than any other. Patients who previously have had good health and good habits may, by care, enjoy a number of years in comparative comfort. The early termination of the disease depends largely upon the seriousness of the complications, which are more than likely to occur, especially those of the kidneys and those which induce structural change in the arteries themselves.

AORTIC STENOSIS.

Synonym:—Aortic obstruction.

Definition:—A condition of the aortic orifice in which, through the influence of disease, the lumen of the aorta has become narrowed—reduced in size—or constricted, resulting in a permanent obstruction to the flow of the blood from the ventricle. The condition is one of much importance and is evidenced by a murmur, which occurs at the time of systole, and which is usually followed by a characteristic regurgitant murmur. It must be borne in mind, however, that a systolic murmur may occur at other times and from other causes, such as aneurysm or calcareous deposits on the walls of the aorta. If incompetency of the aortic valves is not apparent at the time of the diagnosis of the aortic stenosis, it will soon follow, with unmistakable evidences. This condition seldom follows aortic insufficiency.

Etiology:—While the condition occurs more commonly among men who are advanced in years, because in these atheromatous changes are more apt to occur, it is not uncommon in individuals of either sex and in middle life, and cases occasionally occur in which the condition is thought to have been congenital; however, this may have resulted from a masked or latent form of rheumatism, as this latter disease by inducing endocarditis, is a frequent cause of stenosis at any time of life, from thickening and adhesion of the covering membranes. There is, however, a slow development of stenosis, which occurs from calcareous deposits referred to. Granulations, fibrous thickening and other structural changes and the deposit of vegetations, will each, or all combined, result in the narrowing of the lumen of this important orifice. The condition usually includes changes in the structure of the walls of the aorta, and these changes later, extend to the valves. It is therefore rare that the condition is a simple one. It is almost invariably complex in its character.

Symptomatology:—The pulse beat in aortic stenosis is

usually normal. Occasionally it is slow, regular and not readily compressible, but small; very seldom, if ever, frequent. This corresponds with the heart effort, which is also slow, labored and forceful, sometimes heaving in the advanced cases; however, where there is much dilatation it is apt to be enfeebled. With these conditions, after the disease is well established, there is **headache**, **vertigo**, **syncope** and often **extreme paleness** of the countenance. This latter condition may be a constant one, from **anemia**, which occurs very soon, as a result of the failure in the proper oxygenation of the blood.

It must be borne in mind that the condition may exist quite a long time, perhaps some years, before many symptoms appear; this is due to the fact that compensatory hypertrophy is sufficient. When this is no longer the case, the evidences of impaired circulation are soon apparent, often abruptly so. As the condition progresses, mild dropsical symptoms will occur, such as **edema** of the face or of the feet, but general dropsy is not common.

Prognosis:—If this condition can be correctly diagnosed early, and the patient will follow advice as to habits of life and eating, it can be considered a less unfavorable lesion than perhaps any other valvular disease. The fact, also, that there is advanced atheroma in old men of previously good habits is not necessarily a serious condition, but if there has been dissipation, especially the extreme use of alcohol, and luxurious habits of living, the outlook is much less favorable. In patients of middle life, where the condition is due to fibrinous changes or to the result of severe inflammation, the outlook is much less favorable.

MITRAL INSUFFICIENCY.

Synonyms:—Mitral regurgitation; mitral incompetency.

Definition:—A condition of the mitral valve through a lesion in the mitral leaflets, in which the valve is unable to close the orifice and prevent the return of the blood into the auricle. This may be due to shortening or thickening

or other structural change of the segments of the valve which guard the auriculo-ventricular orifice. This defect may also be due to the contraction of the chordæ tendineæ, which support the leaflets, thus interfering with proper movement of the valve. Calcareous degeneration may also affect the bases of the segments and the tissues of which they are composed, as to materially interfere with the valvular function. A condition of stenosis is also usually present in advanced cases.

Etiology:—This condition occurs most commonly in early adult life, and more often in females than in males. Acute inflammation of the endocardium, either from rheumatism or from other cause, is apt to precede its occurrence, especially if the inflammation is of the ulcerative type, as the ulceration may destroy the chordæ tendineæ and thus prevent perfect valvular action. In later life the excessive use of alcohol or tobacco, and the presence of chronic blood dyscrasia or syphilis may induce the disease. The condition occurs also as a result of chronic kidney disease, especially Bright's disease, from the influence of which, upon the arterial tension, there is a prolonged increase of muscular strain in the left ventricle, the muscular structure of which may be impaired by the general toxemia and blood impoverishment. In these cases the imperfect action of the valve may be due to a dilatation of the auriculo-ventricular orifice.

Symptomatology:—In the early stages of the disease, while there is yet sufficient compensation and no other complicating disorder, there are but few symptoms upon which we can depend to make a correct diagnosis of mitral incompetency. Among the first of these is a mild form of **palpitation**, which is induced by a little unusual physical exercise, or by stair-climbing. Occasionally there will be some **dyspnœa**, which is induced by a temporary pulmonary congestion in rare cases, more especially in those who are enfeebled. There may also be a small amount of **pulmonary hemorrhage**, which is apt to fix the blame of the

condition upon the lungs. As the condition increases all of these symptoms are increased, and there will probably be present a short, sharp **cough**. A few patients will have remarked that they suffer to an uncommon degree from any exposure to **cold**; that cold air has a very severe influence upon them. This is due to the susceptibility of the lung structures to congestion through deficient circulation in the capillaries. It is also due to the increased labor this throws upon the heart in distributing the blood through the general capillary circulation, which is more or less contracted by the influence of the cold. Walking in the cold air produces great fatigue with many of these patients in a very short time. While the exact condition can seldom be diagnosed from these symptoms, it is plainly evident that there is a slowly developing disease of the heart structures, as changes in the structure of the finger tips—clubbing—and of the features, with pallor; or a tendency to cyanosis of the lips, or of the ears, are not uncommon.

When the compensatory hypertrophy is no longer sufficient, both subjective and objective symptoms develop rapidly. Disturbances of the **digestion** and faults of the large glandular organs soon occur, which induce a train of symptoms, which may be attributed to other causes. There may be also increase of the **palpitation**, with extreme shortness of breath and ultimately the patient will be unable to lie down, because of the difficulty of breathing, and because of pain in the epigastric region, which is often present, sometimes persistently severe. If there has been no pulmonary hemorrhage previously it is more than likely to occur at this time, and with this, mild dropsical symptoms appear.

It will be seen upon examination that there is a diffused apex beat of the heart, which may be forcible in character, but is more likely to be feeble and imperfect, with a greatly enlarged area of dulness. The sound heard at the apex is quite characteristic, which may be well said to be diagnostic in character. A murmur occurs simultaneously

with the apex beat, which is soft, but sufficiently loud to be readily distinguished. Later, it may be heard throughout the chest, quite distinctly, of a peculiar quality of sound, which the listener does not fail to recognize after having once heard it. In cases where the pulmonary congestion is severe and there is regurgitation, the pulmonary second sound will be exaggerated.

Diagnosis:—The diagnosis depends upon recognition of the above symptoms, and especially upon the characteristic apex sound. It is important, if possible, to determine whether the condition is due to actual disease of the valve, or to the increase of the lumen of the auriculo-ventricular orifice by dilatation. The latter condition is apt to follow prostrating disease and especially those diseases which influence the muscular structure, resulting in general relaxation, and consequent weakening of the heart muscle, with temporary dilatation. I am confident that I have observed this condition in a number of patients, where the characteristic regurgitant apex murmur was plainly heard during the weakness and by restoring the muscular condition of the patient, and increasing the strength and power of the heart, the valvular action would be sufficient, and the murmur would disappear. The characteristic murmur may also be due to anemia; this must be borne in mind in the diagnosis.

Prognosis:—Age in the patient has much to do with the probable results of this condition. Inflammatory changes of the mitral valves in children, progress rapidly, and a fatal termination is apt to occur usually before the completion of puberty. Those who have passed this stage by extreme caution and a thorough understanding of the seriousness of the condition may be carried over the period of danger until the valve is restored, or heart sounds disappear and a normal condition supervenes. It is necessary with these patients, however, that they exercise carefully until they have reached the period of physical maturity, as violent exercise may induce the return of the

symptoms. In patients who are dissipated or have a severe constitutional dyscrasia, the prognosis is unfavorable, and often the progress of the disease is rapid. This is also true when the condition does not occur until late in life, and especially if the individual be somewhat broken down by previous ill health. In all cases the prognosis is more favorable, if there are no inherited tendencies, no blood taints, either inherited or acquired, and no bad habits, and especially if the previous health has been good.

MITRAL STENOSIS.

Definition:—A narrowing of the left auriculo-ventricular orifice, due either to the disease of the tissues composing the mitral valve, or to thickening and adhesion of the surrounding structures, thus offering an impediment to the free flow of the blood from the left auricle to the left ventricle.

Etiology:—The condition is quite common in children above six years of age, and in young adults, and which occurs more frequently in females than in males. It is dependent upon inflammatory conditions, perhaps most often following acute rheumatic endocarditis. Adhesions take place between the structures of the valves often, which result in a narrowing of this orifice. The term, buttonhole slit has been applied to one form, which is quite common. This may be so small as to admit only the tip of the finger, or too small to admit even a small button. The other form is known as the funnel variety. This is not common, but it has been found as a congenital malformation. The result of these structural changes upon these tissues is that there is thickening and sclerosis, not only of the leaflets of the valve, but of the papillary muscles, and also of the chordæ tendineæ, so that elasticity is entirely gone, and the parts are rigid, stiff and more or less immovable. Later, there is a deposit of calcareous matter, constituting a condition of calcification, which is in no way influenced by treatment. Mitral stenosis also occurs as a direct result of

that form of Bright's disease which is known as interstitial nephritis, the small, red or contracted kidney.

Symptomatology:—The symptoms, in the early stage of the disease, before the structural changes are pronounced, and while there is yet sufficient compensatory hypertrophy, are very few, and may be readily mistaken for those of mitral incompetency. There is a stitch-like **pain** in the region of the apex beat, and any degree of active exercise or violent exertion, will induce at first slight **palpitation**; later a severe palpitation, with extreme difficulty of breathing. Later this symptom becomes pronounced, and is more or less constant, and greatly increased by extreme agitation or muscular effort. The symptoms of pulmonary congestion described under regurgitation are apparent here, which, with the **hemorrhage**, render it extremely difficult at times to make a differential diagnosis. Or, at this time, when there is now no longer sufficient compensation, there is greatly increased tension and sometimes severe hemoptysis, and as a final result there may be **pulmonary apoplexy**. Occasionally there will be mild febrile manifestations, with a small, quickened and **oppressed pulse** easily compressible.

In early life this condition produces a slight deformity of the chest wall—a bulging at the junction of the ribs with the sternum above the epigastrium—at which area there is well defined pulsation, which is not present in the usual place nearer to the nipple. This indicates dilatation of the right ventricle. There is upon palpitation a characteristic thrill in the chest wall, which occurs just preceding the systole, more perceptible in the fifth intercostal space, though quite plainly marked in the fourth. This sign is similar to that occurring in mitral regurgitation, which must be excluded. It is more apt to be present when the patient is erect than when lying down. Another sign which also resembles that found in mitral incompetency is a peculiar heaving of the chest with the heart impulse. In addition to these signs there is pulsation in the epigastrium, or apparently in the liver, which is usually en-

larged. The area of dulness is apt to extend to the right side, with something of a corresponding reduction in the dulness of the left side. This, however, is increased as the disease progresses toward a fatal termination.

Diagnosis:—But little can be said concerning specific points in the diagnosis of this disease. So closely do the symptoms resemble those of mitral regurgitation that the diagnostician is apt to be confused. He must study carefully the latter disease and exclude it in the diagnosis. The very small, rapid pulse, which is sometimes even thread-like, often irregular, and usually very feeble, is one distinctive point. Anders mentions as important diagnostic features, increased precordial dulness upward and to the right, a murmur just above the normal apex beat, distinctly localized, which terminates abruptly with the systolic shock, and which is rough and vibrating in character. Also accentuation of the pulmonic sound, which is distinctly marked.

Prognosis:—The prognosis is by no means favorable; occurring in childhood, the disease is usually fatal; occurring in young, strong adults, it may last several years before any serious impression upon the health is made. Occurring in strong middle life, with proper care, the patient may live to old age and continue to a degree in active employment. It is especially dangerous in mothers at the child-bearing period, as the greatly increased tension may result in rupture of compensation and consequent death.

TRICUSPID REGURGITATION.

Synonyms:—Tricuspid insufficiency; tricuspid incompetency.

Definition:—A condition of the tricuspid valve in which there is failure on its part to completely close the right auriculoventricular orifice, permitting a backward flow of the blood upon contraction of the right ventricle.

Etiology:—This condition is not of common occurrence. It is usually, however, due to chronic organic changes, more

often on the left side of the heart, from which interference with free passage of the blood from the lung results in an increased strain upon the tricuspid valve. The condition may also result from chronic disease in the lungs, independent of any heart trouble. It is often the case that the valves themselves are not diseased, but that from heart strain, there is dilatation of the ventricle, resulting in an enlarged orifice. It has been observed that this condition quite frequently follows endocarditis, especially in children, although this statement is denied by some writers. The condition has been observed at birth, and also in the fetus. The evidences of pulmonary congestion are conspicuous at the onset of this condition, in some cases there is a typical bronchitis, or there will be found present a local hypostatic congestion at the base of the lung, and the sputum may have the appearance of that found in croupous pneumonia. It may be rusty colored—uniformly blood stained. The regurgant wave at each contraction of the heart, induces a pulsation in the veins, observable in the jugular vein especially, which becomes distended. It may extend to the subclavian and axillary veins and may be detected in other of the organs. It is especially conspicuous when the patient is lying down. The entire venous system becomes engorged, and this results in a more or less permanent cyanosis, which is greatly increased upon holding the breath.

Diagnosis:—This depends largely upon the presence or absence of the venous pulsation.

Prognosis:—In those patients who are actively engaged in manual labor and in whom the changes have occurred slowly, the prognosis is bad. In young adults who will submit to the essential habits of life and auxiliary treatment the outlook is more favorable. In a few cases, where it depends upon temporary dilatation, a cure can be accomplished if it be undertaken promptly.

TRICUSPID STENOSIS.

This condition occurs rarely in any form, but it occurs as often congenitally as in an acquired form. It is most commonly due to an endocarditis, which has attacked both sides of the heart, and is observed conjointly with mitral stenosis.

Etiology:—The acquired form is usually preceded by an attack of rheumatism, and is of most frequent occurrence in males.

Symptomatology:—The first symptoms are those of defective circulation. There is capillary stasis—local venous engorgement—or cyanosis. Dropsy is a common symptom, although it is more apt to be local than general. Other symptoms are similar to those of mitral stenosis.

Diagnosis:—In this condition, while the jugular vein is greatly distended, there is almost an entire absence of venous pulsation. If dropsy occurs early, with the presystolic murmur present, tricuspid stenosis is almost sure to exist.

PULMONARY INCOMPETENCY AND PULMONARY STENOSIS.

These conditions are very rare. They are more common congenitally than from causes occurring during life. They are difficult of diagnosis, usually remaining undiscovered until revealed by autopsy. If either condition is thought to exist there are so many symptoms present that would suggest other valvular conditions that a diagnosis is uncertain. Pulmonary stenosis is the most common of the two and it occurs from other disease. It follows inflammation of the structure or lining of the heart, as well as atheroma; also other valvular disease and especially ulcerative endocarditis.

Treatment of Valvular Disease.

In no class of diseases is it of greater importance that the best of judgment and careful discrimination be exercised than in the treatment of valvular lesions. So intri-

cate is the mechanism of the heart and its valvular control that medicine administered without discrimination can do harm. It is a common fault among prescribers to administer cardiac stimulants without regard to existing conditions. These can readily disturb the compensation and without doubt have contributed to its rupture. On the other hand, heart sedatives, while among our most important remedies, if not judiciously applied, may readily be made to exercise a harmful depressing influence.

During the stage in which there is sufficient compensation the treatment will necessarily differ from that of the stage in which compensation is lost. In either case it must be borne in mind that the treatment of heart disease should be constitutional in all its bearings. As constitutional conditions depend upon the heart for the perfection of all operations within the body, so inversely, disease of the heart is influenced by a perfection of constitutional conditions, and a normal performance of organic functional operation.

The first consideration in the treatment is rest. This is insisted upon by all authorities. While persistent, unremitting physical labor results directly in heart lesions, there is no doubt that disease of this organ is perhaps often more common among brain workers than among those who exercise persistent physical activity. Not only does brain work throw a great strain upon the heart muscle and on its arteries, but those who engage in severe mental labor neglect physical exercise, and consequently there is an improper balance between the nerve exhaustion and the proper exercise of physical force, resulting in progressive general physical debility. Rest, therefore, not only of the muscular system, but of the brain and nervous system as well, is of the utmost importance. A plan of life should be laid out for the patient in which there should be a fixed number of hours spent in bed, with an equally exact time for quiet, unexciting, out-of-door exercise, except when there is disturbance of the compensation of a serious char-

acter, in which the patient must remain in a recumbent position for days at a time. In cases where there is sufficient compensation the patient may be engaged in some pleasant employment which occupies the mind, but is not at all fatiguing to the body. He must avoid places of amusement which will produce excitement and must avoid anxiety, and especially anger, and must follow a somewhat "hum drum" course of life continuously. Under no consideration should active exercise, such as lifting, carrying, stair climbing or bicycle riding be indulged in, and the use of tobacco and stimulants must be sedulously avoided.

On the other hand, a protracted existence in the open air, and exposure to sun light are of direct benefit. These conduce to a good appetite, to cheerful spirits and to perfect sleep, all of which are of vital importance. These statements are especially true because the tunics of the heart and of its valves are easily influenced by defective nutrition, consequently the highest degree of nutrition must be maintained with the least possible effort on the part of the digestive and assimilative organs. Anemia not only results in influencing most materially the character of the heart tone, but it prevents oxygenation of the blood, and thus increases the essential work of the heart. In selecting any remedial agent, therefore, it must be borne in mind that nothing must be given which will in any way disturb the action of the stomach or intestinal tract. This is an important consideration in selecting *digitalis* as a remedy, because, while it is of value in many conditions, it often is not well borne by the stomach. These facts emphasize the statement previously made that all existing conditions of the system, or of organs other than the heart, must receive the most careful attention when adjusting a plan of treatment of valvular lesions.

Inasmuch as a large proportion of heart troubles depend upon the extent of those conditions which induce rheumatism it is of vital importance that rheumatic tendencies of all kinds be overcome entirely by the best selected methods.

This can be accomplished in part by careful elimination and by the adjustment of a proper diet. In a large number of cases the exclusion of nitrogenous food will materially assist in eradicating the condition. Tea, coffee and tobacco must be excluded, as well as the use of alcoholic liquors, and cocoa also, with many patients, is injurious. In other cases a careful selection of meat diet and albuminous food is necessary, to the exclusion of starchy principles. Each case must be studied separately to determine a proper food adjustment.

As routine treatment we are safe in prescribing **hydrastis**, **nux vomica** and **iron** during a prolonged period. The result of the action of these three remedies is both direct and indirect restoration of the red blood corpuscles, and restoration of the highest degree of functional activity on the part of the gastric and intestinal glands, and of the large glandular organs. This greatly improves the tone of the nervous system and encourages the exercise of the best possible nervous influence upon all organs. In giving **nux vomica** the agent must be given in small doses, and when any irritation of the nervous system appears it should be discontinued for a short period or until it will not act as an excitant. **Hydrastis** is always acceptable. It may be given either in the form of a powder, which is desirable when the coats of the stomach are diseased; or as colorless **hydrastis** when there is evidence of weakness of the arteries or veins; in the form of a heavy fluid extract when the muscular system is out of tone, and the alkaloid **hydrastin** or **berberin** should be given when the remedy is required for its direct influence upon the central nervous system. In selecting a preparation of **iron**, I have for many years prescribed the **ethereal tincture of the perchlorid**, made according to the German Pharmacopœia. I give this in doses of from two to eight minims, three, four or five times a day, diluted with water. I have had opportunity to compare this with our own tincture of the perchlorid and have in every instance decided that I obtained the best results

from the German tincture. Other remedies with which to accomplish the result of those above named are the **bisulphate of quinine** in small doses, or an elixir of the **calisaya** and **iron**, and **phosphorus**. To this list could be well added **collinsonia**, **avena sativa**, **gentian**, **colombo** and occasionally **cimicifuga** and the **arsenate of strychnine**. When the function of digestion is greatly impaired, artificial digestives must be used with all food, and **cod liver oil** and **malt** preparations may be prescribed in selected cases to advantage.

In treating the conditions existing with the heart lesions each should, if possible, be considered separately. There is a class of cases—those of the diseases of the mitral and tricuspid valves, in which there is marked pulmonary congestion. Congestion also occurs in other heart faults, where the tension is low and where the capillary circulation is impeded. In these cases **belladonna** is a remedy of much importance. It should not be given continuously for weeks, but may be given for perhaps seven days and then discontinued for two or three days, to be prescribed again for a similar period and again to be discontinued. The doses should be small and its marked physiological influence upon the secretions should be avoided. Congestion of the liver and of the gastro-intestinal mucous membranes, which is common at this time, is directly antagonized by this remedy, which, if given with **hydrastis** and **nux vomica**, above referred to, promotes other influences which greatly enlarge their field.

It is often necessary to treat the liver directly. I have found, as a result of congestion of this organ, a diffused tenderness over its entire area, with small, quick, sharp, cutting pains. These indicate the use of **bryonia**, and it is surprising how quickly its influence will be observed. At other times stagnant portal circulation, with deficient excretion of bile, as shown by a slight jaundice and constipation, with clay-colored feces when passed, may be met with **leptandrin**, **iris**, **chionanthus**, **euonymus** or **chelidon-**

ium as the indicated remedies. At other times sodium phosphate alone, in hot water, four or five times a day, will be of great service, or this salt and the bitartrate of potassium will be of service if there are evidences of excessive acidity. General symptoms may not appear until just before or attending an immediate rupture of compensation. At this time more active medication will be demanded. *Belladonna*, however, will meet many of the indications, as it is a mild stimulant to the capillary circulation, and sedative to heart irritability, while it overcomes congestion.

Perhaps no remedy in the treatment of valvular disease has had more attention than *digitalis*. It has been thoroughly studied, until its action is well understood. It is to be regretted that other of our heart remedies have not been as thoroughly studied. However, opportunity has not yet presented with several of them, as they are comparatively new. *Digitalis*, fortunately, acts to a better advantage when combined with the tonics which we have just named, and more particularly with iron. Its influence is slow, not pronounced in tonic properties until it has long been given, and as there is danger of cumulative influence it must be given in small doses, frequently repeated. From three to five drops of the tincture, every three or four hours, will be sufficient. This influence should be watched, for it diminishes the number of heart beats, increases the force of the pulsation and increases also arterial tension; at the same time it augments the urinary discharge. It conduces to a filling of the coronary arteries, and if there is a progressive improvement in the character of the blood, this improves the tone of the heart muscle. It must be remembered, however, that this agent increases the irritability of the febrillæ of the heart muscle, and this condition at times is undesirable. If a pronounced action upon the kidneys is desired the remedy must be given in infusion. In dropsical conditions, when extreme excretion is desired, it is best to undertake this result through one set of emunctories only at a time. It is not desirable to stimulate the skin or kid-

neys and the intestinal tract at once. In fact, it is difficult to obtain simultaneously a free action from the kidneys and the skin. The free action of digitalis upon the kidneys has been accomplished by applying a poultice of digitalis leaves steeped in hot water, across the loins. The profound stimulating influence produced by large doses of digitalis upon a very feeble heart has resulted in sudden death a number of times when the patient, after having been lying down, would rise quickly to a sitting posture. The heart has not been able to quickly adjust itself to the changed conditions. There is dizziness, rapid and feeble pulse, difficulty of breathing and cyanosis. If, during the use of this remedy, these symptoms occur, with headache, vertigo and distorted vision, the remedy must be immediately discontinued. In aortic stenosis digitalis is positively contraindicated.

The action of *cimicifuga* upon the heart is similar to that of digitalis when the cause of the disorder is in the muscular structure of the heart or when it results from a rheumatic diathesis. It removes the causes of the disease, improves the tone of the heart muscle, encourages nutrition and acts as a sedative to any existing nervous irritability. It is of value also in angina pectoris and in functional irregularity of the heart, where there is marked irritability. In the early stages of valvular disease, with no apparent heart weakness, the irritability will be relieved by the action of this remedy given in conjunction with gelsemium.

The action of *cactus grandiflorus* in this class of diseases we believe to be in many ways superior to that of digitalis. This remedy increases the musculo-motor energy of the heart, elevates arterial tension, increasing the height and force of the pulse wave. This is accomplished by increased heart action through stimulation of the vasomotor centers and stimulation of the spinalmotor centers. It increases their activity by improving the general nerve tone. It is the heart tonic par excellence, as it produces stimulation

from increased nerve tone in the heart through improved nutrition of the entire nervous and muscular structure of that organ. It produces no irritation of the heart muscle like *strophanthus*, nor gastric irritation or cumulation like *digitalis*. It also exercises a direct influence over the sympathetic nervous system, regulating its action, restoring normal action, whatever the perversion, and acting directly upon the cardiac plexus, it regulates the functional operations of the heart.

Investigations have proven that this remedy increases the contractile power and energy of the heart muscle through the intercardiac ganglia and accelerator nerves. It certainly improves the nutrition of the heart, as we have noticed the entire removal of progressive valvular murmurs after its continued use. It will thus be seen that it is indicated in a larger proportion of valvular disease and seldom contra-indicated. It may be prescribed with confidence whenever the heart muscle is enfeebled and whenever there is a progressive valvular insufficiency, with irregular, intermittent, feeble pulse, and in any form of regurgitation. It is of wider value than *digitalis*, as it also materially assists in the restoration of the nervous system and in the improvement of the nervous tone. The remedy need not be given in large doses usually. From two to five drops of specific *cactus* every three or four hours will be sufficient ordinarily, yet, in an occasional case of extreme weakness of the heart muscle, from ten to thirty minims may be given with impunity, as no toxic properties have as yet been observed.

Strophanthus is given as a remedy for valvular disorders when there are disturbances of compensation. Its influence, however, is narrower than that of either *digitalis* or *cactus*. There is good authority for believing that it acts by contact upon the heart muscle, producing muscular contraction by irritation of the muscular fibrillæ. It does not influence the vascular system to any great degree. It does not greatly improve the tone of the heart, or of the nervous system.

This explains its limitations. Vacci claimed that strophanthus materially assists in the appropriation of iron. This, if true, would be an important influence in those cases accompanied with extreme anemia.

Germain-Sée mentioned the following influence of *convallaria majalis* in valvular disease. In mitral constriction, especially when it is accompanied by failure of compensation on the part of the left auricle and right ventricle, the contractile force augments visibly under the convallaria, as the sphygmograph testifies. In mitral insufficiency, especially where there are pulmonary congestions, and when, as a consequence, there is dyspnoea, with or without respiratory neuroses, and also in dilatation of the left ventricle, without compensatory hypertrophy, it restores energy of the heart, which tends to become more and more feeble and dilated. In dilatations of the heart, with or without fatty degeneration, with or without sclerosis of muscular tissue, the indications for convallaria are clear. In all cardiac affections indifferently, from the moment that watery infiltrations appear, convallaria has an action evident, prompt and certain.

Lycopus has a field in this class of troubles that is important, although limited. It tranquillizes the action of the heart, removes irritability and promotes normal capillary activity throughout the entire respiratory apparatus. This is especially important when in mitral or tricuspid stenosis the marked pulmonary congestion results in hemoptysis, with more or less cough. It has no depressing influence, but rather promotes the tone of the heart muscle.

Caffeine is of importance when from failure of compensation immediate exhaustion is threatened. It stimulates the heart without irritation, overcoming depression from any cause, and encouraging a smoothness of action. It is indicated where extreme feebleness results from dilatation in the presence of valvular insufficiency or fatty degeneration. It is an important remedy in proper combination in certain cases of dropsy.

A remedy of great importance in valvular insufficiency is **apocynum**. It has been given when *strophanthus* and *convallaria* had failed. It acts similarly to *digitalis* and enhances the influence of *cactus* in dropsical conditions. It promotes actively the removal of pericardial effusions and increases the tone of the heart muscle. It will often cure extreme cases of dropsy which depend upon valvular disorders. Its influence must be carefully studied. In the ordinary preparations it occasionally irritates the stomach and intestinal tract, except when given in very small doses, but the distilled extract is perhaps fully as efficient as any other form and does not produce irritation.

Crataegus oxyacantha was brought before the profession a few years ago as a remedy for atheromatous conditions and valvular troubles resulting therefrom. While a few startling results have been announced in pronounced cases, even where there was failure of compensation, there are other similar cases in which the remedy has been prescribed by a number of physicians with no marked results. I have obtained the best results from this remedy, in that class of cases where, from violent exercise, from prolonged exhausting overwork, or nervous shock, sudden or acute neurasthenia had occurred, and from which evidences of heart weakness, with perhaps some dilatation, accompanied with severe dyspnoea on any exertion, was accompanied with regurgitant murmurs. In these cases the influence of the remedy was pronounced, all heart sounds disappearing after using it for a few weeks. Nerve tonics, however, were given conjointly and rest was enjoined with concentrated nutrition.

The dropsy resulting from valvular insufficiency, or from heart disorder, must be directly combated. In addition to the use of **apocynum** we have a number of other remedies which are efficacious, but which do not, like **apocynum**, act directly upon the heart. Among these are **haircap moss**, **birch leaves**, **sourwood leaves**, as well as the well-known **hydragogue cathartics**, such as **elaterium**, **magnesium**

sulphate and potassium bitartrate. These may be selected with reference to other and more exact action, and the dosage should be adjusted to the patient. In some cases large, active doses only will be beneficial, while in weak and more prostrate cases small doses, frequently repeated, will often accomplish a more desirable result.

Massage and proper muscular movements are advantageous in the treatment of valvular disease. These all are conducted with reference to encouraging the movement of the blood through the veins and promoting a free return of the blood into the right auricle, in order to relieve as much as possible the strain upon the muscular structure of the heart. The benefit in such a case is sometimes pronounced from the first. This idea has received considerable attention at times and a number of systems have been evolved, a knowledge of which may be readily acquired and easily applied. So serious are these lesions and of such vital import, that not only direct treatment must be used, but every auxiliary measure possible must be adjusted to each case.

Neuroses of the Heart.

Definition:—Certain conditions depending upon a fault in the nervous control of the heart or upon impairment of nerve influence within the heart. These conditions are manifested by alterations in the action of the heart and often by serious interference with its normal functional activity. They are not in themselves, with perhaps the exception of angina pectoris, of a serious character; among these are arhythmia, palpitation, tachycardia, bradycardia and angina pectoris.

ARYTHMIA.

Synonym:—Irregularity in the pulsation of the heart.

Definition:—A condition in which the disordered nervous control of the heart induces irregularity of action, both in the time and character of the pulse beat. Intermittency of the heart's action refers to a condition in which, while the rhythm may not vary, there will be occasionally a regular loss of one or more beats. The lost beat may occur regularly on each alternating pulsation, or it may occur every third beat, or regularly every fourth, fifth or sixth beat. When many beats occur between the intermissions, there is apt to be variation of from one to four beats. It may occur at one time, on the twelfth stroke, the next time on the fourteenth, and the next time on the eleventh, and so on. This may be influenced by lying down, or by exertion, or upon forced rapidity of breathing. Irregularity of the

intermission is not uncommon. Irregularity of the beats, without intermission, is often of no great importance; irregularity in the rhythm of the heart may not be at all serious in character.

Etiology:—The following classification of Baumgarten is the one now adopted by most writers: 1st. Those due to causes situated in the nerve centers, either of a physical or mental character. 2nd. Reflex influences resulting from disease of the important organs of the body. 3rd. Those causes which are toxic in character, resulting from auto-toxæmia, or from the use of tea, coffee, alcohol and tobacco. 4th. Those resulting from disease of the heart itself. The first three of these are functional, although if persistently occurring, organic change may be induced in the heart by their presence. The last, of course, is organic. The symptoms of irregularity of the action of the heart are not always conspicuous and are often considered of no importance. There may be no impression whatever upon the patient's health, the irregularity being so mild as to no way influence the function of any organ. If, however, the irregularity be accompanied with palpitation, the influence upon the patient may be very conspicuous, and often apparently serious.

Diagnosis:—This depends upon the presence or absence of organic heart change. Palpation and auscultation will assist in determining the presence of chronic conditions as a cause of the irregularity. A thorough examination of the condition of the patient's system must be made in order to determine the presence of reflex causes, or those of cerebral origin. All possible causes of the condition must be thoroughly considered.

Treatment:—The first consideration in the treatment is the removal of the cause. In fact, but little can be done in regulating the action of the heart unless the cause is removed. We would, therefore, refer the reader to the consideration of the treatment of the diseases which act as causes of this irregularity. One of the commonest

causes in young men is the use of cigarettes, from which arrhythmia, with mild palpitation and pronounced cardiac weakness will soon result. The importance of discarding tobacco, tea, coffee and alcohol in these cases, cannot be too greatly emphasized. Disorders of digestion are common causes and these should have treatment directed to their removal. I have observed, however, that *cactus* given with *hydrastis* will remove the larger proportion of these cases, provided there is no exaltation of nerve force, but when from this cause there is irritability of the action of the heart, it is desirable to use *gelsemium*, or a *bromid*, with *hydrastis*, or other properly adjusted stomach tonic. The bromide of strontium is a remedy of excellent service in its influence upon the central nervous system and upon the heart, when gastric disturbances induce the irritation. The use of small doses of *nux vomica* or of the *strychnin arsenate*, or *zinc valerianate*, will be found of service in carefully selected cases.

There are times when the irregularity seems threatening in its character, in which case a remedy directed through its stimulating influence upon the heart's action to the condition in hand must be selected. I have found some cases to be relieved quickly and satisfactorily by the use of a mild direct stimulant to the stomach. *Capsicum*, ginger or peppermint, with or without the use of *eupatorium*, have often exercised a prompt and very satisfactory influence in cases of abrupt occurrence. I have obtained benefit from the action of an alkaline remedy continued for some little time, when such a remedy was indicated, and have been impressed with the necessity of eliminating the urates and other causes of autotoxemia. A saline laxative, which will act without irritation, is of benefit occasionally.

PALPITATION.

Definition:—A disturbance of the complex mechanism of the heart, inducing paroxysms of abnormal action, characterized by increase of rapidity with violent or irregu-

lar movement, in which the force of the heart is usually temporarily increased, resulting in weakness, anxiety, difficult breathing, and accompanied in severe cases, with a cold sweat.

Etiology:—The causes of this condition are several; they may be extraneous in character, as from distention of the stomach with gas, thoracic effusions, or by the influence of rarefied air, as in mountain climbing. They may be reflex in character, induced by irritation or pain in any of the other organs or in the intestinal canal; or it may be induced by toxins, or from the excessive use of alcoholic liquors, and tobacco, or from tea and coffee; and also, from autointoxication. It may be due to disease either in the central nervous system, or of the sympathetic apparatus, or very rarely of the heart and arteries. Finally, it is quite common as the result of psychic conditions, as when induced by emotional causes, as distress, anxiety, or fear, or influenced by great sorrow; or by prolonged mental effort, resulting in acute nervous exhaustion. The condition is very common in patients who suffer from neurasthenia.

The mechanism of the heart is exceedingly complex. The intricate motor-apparatus promotes independent motion, but must receive accessions of force from the central nervous system. This nerve influence exercises an inhibiting power upon the heart, to preserve its action at a uniform rate, but the action of the organ is also influenced by certain properties within the blood vessels themselves; by the character and density of the blood; by the proper exercise of the respiratory function, involving or including oxygenation; and by the proper exercise of other important functions of animal life. So intimately is this mechanism concerned in the performance of all of the vital functions that any remote disturbances may readily influence the action of the heart.

Symptomatology:—Palpitation occurs, usually, with no premonitory symptoms. In the milder cases the patient is

at once conscious that there is sudden increased violence of the heart's action. This causes alarm, sometimes fear, and there may be precordial oppression, and some dull pain. Rarely, a slight pallor may overspread the countenance, although in most cases the face is flushed. It will be seen that the heart is slower than normal, and that the pulse beats are very full and large, although soft. In many cases there is but little disturbance of the rhythm. In other cases the irregularity of the beat is itself a distressing factor. These attacks occur without regularity, but those that depend upon disturbance of digestion will follow the taking of food, and those which occur from smoking, and the use of alcohol, will be apt to occur following any such excessive indulgence. The character of the beat will in no two cases be alike; it may be said that it is always tumultuous, and also accompanied with great discomfort and anxiety. Usually the patient must occupy a sitting posture, as it is impossible to lie down; soon he becomes weak and faint; there is dizziness and uncertainty of action; the pulse becomes weak, and as time passes, with no cessation of the difficulty, the feebleness increases and it becomes rapid and compressible. Usually, in the advanced stage of the difficulty, the rhythm is disturbed, and the heart is weak.

Auscultation shows no clear symptoms; the different heart sounds cannot be separately distinguished, because of the violence of the movement, and usually there are no valvular sounds apparent. The attack will cease in most cases as suddenly as it occurs; sometimes there will be only a few pulsations before the heart resumes its normal action; at other times the condition may last several hours; at still other times there may be a condition of palpitation, in which there are frequent irregular occurrences of the palpitation, with a complete intermission of a longer or shorter period, varying from half of a minute to four or five minutes. This state may last for several hours, or

even for a day or two, to finally abate by a gradual increase in the length of the intermissions.

However occurring, this condition results in temporary weakness, as it causes a shock of greater or less severity to the central nervous system. In the milder cases, the shock is too feeble to be appreciated. In severe cases, the patient may be several days in recovering from it.

Treatment:—A patient subject to attacks of palpitation should receive most careful attention from the physician. If the case is obscure, he should study every condition of that patient's system, until he determines the exact cause. A course of treatment must be laid out which will not only remove the cause, but will remove all factors that contribute to it. The patient must be assured with positiveness that there is no danger from the attacks, as death seldom, if ever, occurs during the period of palpitation, and relief from anxiety will contribute largely to the patient's immediate recovery. So common is the condition due to digestive faults—autotoxemia, and especially from the absorption of gases, which are the product of fermentation of food—that the first attention must be paid to the stomach and digestion. The so-called nervous dyspepsia is a very common cause of palpitation in neurasthenics. In these cases, the nervous system must be built up with the most positive nerve tonics and restoratives before the condition of the appetite will be greatly improved. The use of coffee, tea, and the ingestion of heavy meat diet with these patients must be proscribed and a vegetable diet substituted often, at least for a few weeks, and an active eliminative treatment adopted in order to rid the system of nitrogenous waste and other toxins. The patient must take an artificial digestive with all food, which must be selected with great care. Patients suffering from sorrow or mental distress, must be removed to an entirely new environment, and brought into contact with conditions, all of which are materially changed from the usual routine. A thorough cleansing of the intestinal tract is sometimes

necessary ; and when tapeworm is the cause, as it occasionally is, this must be removed.

There are no specifics with which to immediately overcome an attack of palpitation. In severe and protracted cases, accompanied with pain, it may be necessary to administer a hypodermic of one-eighth of a grain of **morphin**. Usually, in extreme cases, ten drops of the **essence of peppermint**, with or without one-fourth of a dram of the **ginger**, given in hot water, will be sufficient. In other cases, a teaspoonful of the **sodium bicarbonate**, given in hot water, will produce immediate relief, especially if the evidences of gastric acidity are pronounced. Fifteen minims of specific **eupatorium**, repeated every half hour, will be of benefit. In others, an infusion of **capsicum** will relieve the condition. At times the external application of fifteen minims of **chloroform** in the palm of the hand, held firmly over the heart, until severe burning is produced, will result in immediate benefit. Where the symptoms are alarming, and there is extreme pallor, an inhalation of **amyl nitrate** will be sufficient. In others, **glonoin**, in granules of the one-two-hundredth of a grain each, every fifteen minutes, until four or five are taken, will be sufficient. Some physicians advise swallowing small fragments of ice, or an application of ice over the heart. Others will apply heat to the chest, and advise the patient to drink hot drinks ; it is not advisable, however, to distend the stomach with fluids. The palpitation will cease more readily if the stomach be empty. Counter-irritation, or an application of cold over the sympathetic ganglia of the spinal cord, will sometimes give immediate relief. This may be accomplished with the chloroform application above described, or other available measures.

ANGINA PECTORIS.

Synonyms:—Neuralgia of the heart ; stenocardia ; breast-pang.

Definition:—An acute paroxysmal pain in the heart and

acter, in which the patient must remain in a recumbent position for days at a time. In cases where there is sufficient compensation the patient may be engaged in some pleasant employment which occupies the mind, but is not at all fatiguing to the body. He must avoid places of amusement which will produce excitement and must avoid anxiety, and especially anger, and must follow a somewhat "hum drum" course of life continuously. Under no consideration should active exercise, such as lifting, carrying, stair climbing or bicycle riding be indulged in, and the use of tobacco and stimulants must be sedulously avoided.

On the other hand, a protracted existence in the open air, and exposure to sun light are of direct benefit. These conduce to a good appetite, to cheerful spirits and to perfect sleep, all of which are of vital importance. These statements are especially true because the tunics of the heart and of its valves are easily influenced by defective nutrition, consequently the highest degree of nutrition must be maintained with the least possible effort on the part of the digestive and assimilative organs. Anemia not only results in influencing most materially the character of the heart tone, but it prevents oxygenation of the blood, and thus increases the essential work of the heart. In selecting any remedial agent, therefore, it must be borne in mind that nothing must be given which will in any way disturb the action of the stomach or intestinal tract. This is an important consideration in selecting *digitalis* as a remedy, because, while it is of value in many conditions, it often is not well borne by the stomach. These facts emphasize the statement previously made that all existing conditions of the system, or of organs other than the heart, must receive the most careful attention when adjusting a plan of treatment of valvular lesions.

Inasmuch as a large proportion of heart troubles depend upon the extent of those conditions which induce rheumatism it is of vital importance that rheumatic tendencies of all kinds be overcome entirely by the best selected methods.

This can be accomplished in part by careful elimination and by the adjustment of a proper diet. In a large number of cases the exclusion of nitrogenous food will materially assist in eradicating the condition. Tea, coffee and tobacco must be excluded, as well as the use of alcoholic liquors, and cocoa also, with many patients, is injurious. In other cases a careful selection of meat diet and albuminous food is necessary, to the exclusion of starchy principles. Each case must be studied separately to determine a proper food adjustment.

As routine treatment we are safe in prescribing **hydrastis**, **nux vomica** and **iron** during a prolonged period. The result of the action of these three remedies is both direct and indirect restoration of the red blood corpuscles, and restoration of the highest degree of functional activity on the part of the gastric and intestinal glands, and of the large glandular organs. This greatly improves the tone of the nervous system and encourages the exercise of the best possible nervous influence upon all organs. In giving **nux vomica** the agent must be given in small doses, and when any irritation of the nervous system appears it should be discontinued for a short period or until it will not act as an excitant. **Hydrastis** is always acceptable. It may be given either in the form of a powder, which is desirable when the coats of the stomach are diseased; or as colorless **hydrastis** when there is evidence of weakness of the arteries or veins; in the form of a heavy fluid extract when the muscular system is out of tone, and the alkaloid **hydrastin** or **berberin** should be given when the remedy is required for its direct influence upon the central nervous system. In selecting a preparation of **iron**, I have for many years prescribed the **ethereal tincture of the perchlorid**, made according to the German Pharmacopœia. I give this in doses of from two to eight minims, three, four or five times a day, diluted with water. I have had opportunity to compare this with our own tincture of the perchlorid and have in every instance decided that I obtained the best results

from the German tincture. Other remedies with which to accomplish the result of those above named are the **bi-sulphate of quinine** in small doses, or an elixir of the **calisaya** and **iron**, and **phosphorus**. To this list could be well added **collinsonia**, **avena sativa**, **gentian**, **colombo** and occasionally **cimicifuga** and the **arsenate of strychnine**. When the function of digestion is greatly impaired, artificial digestives must be used with all food, and **cod liver oil** and **malt** preparations may be prescribed in selected cases to advantage.

In treating the conditions existing with the heart lesions each should, if possible, be considered separately. There is a class of cases—those of the diseases of the mitral and tricuspid valves, in which there is marked pulmonary congestion. Congestion also occurs in other heart faults, where the tension is low and where the capillary circulation is impeded. In these cases **belladonna** is a remedy of much importance. It should not be given continuously for weeks, but may be given for perhaps seven days and then discontinued for two or three days, to be prescribed again for a similar period and again to be discontinued. The doses should be small and its marked physiological influence upon the secretions should be avoided. Congestion of the liver and of the gastro-intestinal mucous membranes, which is common at this time, is directly antagonized by this remedy, which, if given with **hydrastis** and **nux vomica**, above referred to, promotes other influences which greatly enlarge their field.

It is often necessary to treat the liver directly. I have found, as a result of congestion of this organ, a diffused tenderness over its entire area, with small, quick, sharp, cutting pains. These indicate the use of **bryonia**, and it is surprising how quickly its influence will be observed. At other times stagnant portal circulation, with deficient excretion of bile, as shown by a slight jaundice and constipation, with clay-colored feces when passed, may be met with **leptandrin**, **iris**, **chionanthus**, **euonymus** or **chelidon-**

ium as the indicated remedies. At other times sodium phosphate alone, in hot water, four or five times a day, will be of great service, or this salt and the bitartrate of potassium will be of service if there are evidences of excessive acidity. General symptoms may not appear until just before or attending an immediate rupture of compensation. At this time more active medication will be demanded. *Belladonna*, however, will meet many of the indications, as it is a mild stimulant to the capillary circulation, and sedative to heart irritability, while it overcomes congestion.

Perhaps no remedy in the treatment of valvular disease has had more attention than *digitalis*. It has been thoroughly studied, until its action is well understood. It is to be regretted that other of our heart remedies have not been as thoroughly studied. However, opportunity has not yet presented with several of them, as they are comparatively new. *Digitalis*, fortunately, acts to a better advantage when combined with the tonics which we have just named, and more particularly with iron. Its influence is slow, not pronounced in tonic properties until it has long been given, and as there is danger of cumulative influence it must be given in small doses, frequently repeated. From three to five drops of the tincture, every three or four hours, will be sufficient. This influence should be watched, for it diminishes the number of heart beats, increases the force of the pulsation and increases also arterial tension; at the same time it augments the urinary discharge. It conduces to a filling of the coronary arteries, and if there is a progressive improvement in the character of the blood, this improves the tone of the heart muscle. It must be remembered, however, that this agent increases the irritability of the febrillæ of the heart muscle, and this condition at times is undesirable. If a pronounced action upon the kidneys is desired the remedy must be given in infusion. In dropsical conditions, when extreme excretion is desired, it is best to undertake this result through one set of emunctories only at a time. It is not desirable to stimulate the skin or kid-

neys and the intestinal tract at once. In fact, it is difficult to obtain simultaneously a free action from the kidneys and the skin. The free action of digitalis upon the kidneys has been accomplished by applying a poultice of digitalis leaves steeped in hot water, across the loins. The profound stimulating influence produced by large doses of digitalis upon a very feeble heart has resulted in sudden death a number of times when the patient, after having been lying down, would rise quickly to a sitting posture. The heart has not been able to quickly adjust itself to the changed conditions. There is dizziness, rapid and feeble pulse, difficulty of breathing and cyanosis. If, during the use of this remedy, these symptoms occur, with headache, vertigo and distorted vision, the remedy must be immediately discontinued. In aortic stenosis digitalis is positively contraindicated.

The action of *cimicifuga* upon the heart is similar to that of digitalis when the cause of the disorder is in the muscular structure of the heart or when it results from a rheumatic diathesis. It removes the causes of the disease, improves the tone of the heart muscle, encourages nutrition and acts as a sedative to any existing nervous irritability. It is of value also in angina pectoris and in functional irregularity of the heart, where there is marked irritability. In the early stages of valvular disease, with no apparent heart weakness, the irritability will be relieved by the action of this remedy given in conjunction with gelsemium.

The action of *cactus grandiflorus* in this class of diseases we believe to be in many ways superior to that of digitalis. This remedy increases the musculo-motor energy of the heart, elevates arterial tension, increasing the height and force of the pulse wave. This is accomplished by increased heart action through stimulation of the vasomotor centers and stimulation of the spinalmotor centers. It increases their activity by improving the general nerve tone. It is the heart tonic par excellence, as it produces stimulation

from increased nerve tone in the heart through improved nutrition of the entire nervous and muscular structure of that organ. It produces no irritation of the heart muscle like *strophanthus*, nor gastric irritation or cumulation like *digitalis*. It also exercises a direct influence over the sympathetic nervous system, regulating its action, restoring normal action, whatever the perversion, and acting directly upon the cardiac plexus, it regulates the functional operations of the heart.

Investigations have proven that this remedy increases the contractile power and energy of the heart muscle through the intercardiac ganglia and accelerator nerves. It certainly improves the nutrition of the heart, as we have noticed the entire removal of progressive valvular murmurs after its continued use. It will thus be seen that it is indicated in a larger proportion of valvular disease and seldom contra-indicated. It may be prescribed with confidence whenever the heart muscle is enfeebled and whenever there is a progressive valvular insufficiency, with irregular, intermittent, feeble pulse, and in any form of regurgitation. It is of wider value than *digitalis*, as it also materially assists in the restoration of the nervous system and in the improvement of the nervous tone. The remedy need not be given in large doses usually. From two to five drops of specific cactus every three or four hours will be sufficient ordinarily, yet, in an occasional case of extreme weakness of the heart muscle, from ten to thirty minims may be given with impunity, as no toxic properties have as yet been observed.

Strophanthus is given as a remedy for valvular disorders when there are disturbances of compensation. Its influence, however, is narrower than that of either *digitalis* or *cactus*. There is good authority for believing that it acts by contact upon the heart muscle, producing muscular contraction by irritation of the muscular fibrillæ. It does not influence the vascular system to any great degree. It does not greatly improve the tone of the heart, or of the nervous system.

This explains its limitations. Vacchi claimed that strophanthus materially assists in the appropriation of iron. This, if true, would be an important influence in those cases accompanied with extreme anemia.

Germain-Sée mentioned the following influence of *convallaria majalis* in valvular disease. In mitral constriction, especially when it is accompanied by failure of compensation on the part of the left auricle and right ventricle, the contractile force augments visibly under the convallaria, as the sphygmograph testifies. In mitral insufficiency, especially where there are pulmonary congestions, and when, as a consequence, there is dyspnoea, with or without respiratory neuroses, and also in dilatation of the left ventricle, without compensatory hypertrophy, it restores energy of the heart, which tends to become more and more feeble and dilated. In dilatations of the heart, with or without fatty degeneration, with or without sclerosis of muscular tissue, the indications for convallaria are clear. In all cardiac affections indifferently, from the moment that watery infiltrations appear, convallaria has an action evident, prompt and certain.

Lycopus has a field in this class of troubles that is important, although limited. It tranquillizes the action of the heart, removes irritability and promotes normal capillary activity throughout the entire respiratory apparatus. This is especially important when in mitral or tricuspid stenosis the marked pulmonary congestion results in hemoptysis, with more or less cough. It has no depressing influence, but rather promotes the tone of the heart muscle.

Caffeine is of importance when from failure of compensation immediate exhaustion is threatened. It stimulates the heart without irritation, overcoming depression from any cause, and encouraging a smoothness of action. It is indicated where extreme feebleness results from dilatation in the presence of valvular insufficiency or fatty degeneration. It is an important remedy in proper combination in certain cases of dropsy.

A remedy of great importance in valvular insufficiency is *apocynum*. It has been given when *strophanthus* and *convallaria* had failed. It acts similarly to *digitalis* and enhances the influence of *cactus* in dropsical conditions. It promotes actively the removal of pericardial effusions and increases the tone of the heart muscle. It will often cure extreme cases of dropsy which depend upon valvular disorders. Its influence must be carefully studied. In the ordinary preparations it occasionally irritates the stomach and intestinal tract, except when given in very small doses, but the distilled extract is perhaps fully as efficient as any other form and does not produce irritation.

Crataegus oxyacantha was brought before the profession a few years ago as a remedy for atheromatous conditions and valvular troubles resulting therefrom. While a few startling results have been announced in pronounced cases, even where there was failure of compensation, there are other similar cases in which the remedy has been prescribed by a number of physicians with no marked results. I have obtained the best results from this remedy, in that class of cases where, from violent exercise, from prolonged exhausting overwork, or nervous shock, sudden or acute neurasthenia had occurred, and from which evidences of heart weakness, with perhaps some dilatation, accompanied with severe dyspnoea on any exertion, was accompanied with regurgitant murmurs. In these cases the influence of the remedy was pronounced, all heart sounds disappearing after using it for a few weeks. Nerve tonics, however, were given conjointly and rest was enjoined with concentrated nutrition.

The dropsy resulting from valvular insufficiency, or from heart disorder, must be directly combated. In addition to the use of *apocynum* we have a number of other remedies which are efficacious, but which do not, like *apocynum*, act directly upon the heart. Among these are **haircap moss**, **birch leaves**, **sourwood leaves**, as well as the well-known hydragogue cathartics, such as **elaterium**, **magnesium**

sulphate and potassium bitartrate. These may be selected with reference to other and more exact action, and the dosage should be adjusted to the patient. In some cases large, active doses only will be beneficial, while in weak and more prostrate cases small doses, frequently repeated, will often accomplish a more desirable result.

Massage and proper muscular movements are advantageous in the treatment of valvular disease. These all are conducted with reference to encouraging the movement of the blood through the veins and promoting a free return of the blood into the right auricle, in order to relieve as much as possible the strain upon the muscular structure of the heart. The benefit in such a case is sometimes pronounced from the first. This idea has received considerable attention at times and a number of systems have been evolved, a knowledge of which may be readily acquired and easily applied. So serious are these lesions and of such vital import, that not only direct treatment must be used, but every auxiliary measure possible must be adjusted to each case.

Neuroses of the Heart.

Definition:—Certain conditions depending upon a fault in the nervous control of the heart or upon impairment of nerve influence within the heart. These conditions are manifested by alterations in the action of the heart and often by serious interference with its normal functional activity. They are not in themselves, with perhaps the exception of angina pectoris, of a serious character; among these are arrhythmia, palpitation, tachycardia, bradycardia and angina pectoris.

· ARRHYTHMIA.

Synonym:—Irregularity in the pulsation of the heart.

Definition:—A condition in which the disordered nervous control of the heart induces irregularity of action, both in the time and character of the pulse beat. Intermittency of the heart's action refers to a condition in which, while the rhythm may not vary, there will be occasionally a regular loss of one or more beats. The lost beat may occur regularly on each alternating pulsation, or it may occur every third beat, or regularly every fourth, fifth or sixth beat. When many beats occur between the intermissions, there is apt to be variation of from one to four beats. It may occur at one time, on the twelfth stroke, the next time on the fourteenth, and the next time on the eleventh, and so on. This may be influenced by lying down, or by exertion, or upon forced rapidity of breathing. Irregularity of the

intermission is not uncommon. Irregularity of the beats, without intermission, is often of no great importance; irregularity in the rhythm of the heart may not be at all serious in character.

Etiology:—The following classification of Baumgarten is the one now adopted by most writers: 1st. Those due to causes situated in the nerve centers, either of a physical or mental character. 2nd. Reflex influences resulting from disease of the important organs of the body. 3rd. Those causes which are toxic in character, resulting from auto-toxæmia, or from the use of tea, coffee, alcohol and tobacco. 4th. Those resulting from disease of the heart itself. The first three of these are functional, although if persistently occurring, organic change may be induced in the heart by their presence. The last, of course, is organic. The symptoms of irregularity of the action of the heart are not always conspicuous and are often considered of no importance. There may be no impression whatever upon the patient's health, the irregularity being so mild as to no way influence the function of any organ. If, however, the irregularity be accompanied with palpitation, the influence upon the patient may be very conspicuous, and often apparently serious.

Diagnosis:—This depends upon the presence or absence of organic heart change. Palpation and auscultation will assist in determining the presence of chronic conditions as a cause of the irregularity. A thorough examination of the condition of the patient's system must be made in order to determine the presence of reflex causes, or those of cerebral origin. All possible causes of the condition must be thoroughly considered.

Treatment:—The first consideration in the treatment is the removal of the cause. In fact, but little can be done in regulating the action of the heart unless the cause is removed. We would, therefore, refer the reader to the consideration of the treatment of the diseases which act as causes of this irregularity. One of the commonest

causes in young men is the use of cigarettes, from which arrhythmia, with mild palpitation and pronounced cardiac weakness will soon result. The importance of discarding tobacco, tea, coffee and alcohol in these cases, cannot be too greatly emphasized. Disorders of digestion are common causes and these should have treatment directed to their removal. I have observed, however, that cactus given with *hydrastis* will remove the larger proportion of these cases, provided there is no exaltation of nerve force, but when from this cause there is irritability of the action of the heart, it is desirable to use *gelsemium*, or a bromid, with *hydrastis*, or other properly adjusted stomach tonic. The bromide of strontium is a remedy of excellent service in its influence upon the central nervous system and upon the heart, when gastric disturbances induce the irritation. The use of small doses of *nux vomica* or of the *strychnin arsenate*, or *zinc valerianate*, will be found of service in carefully selected cases.

There are times when the irregularity seems threatening in its character, in which case a remedy directed through its stimulating influence upon the heart's action to the condition in hand must be selected. I have found some cases to be relieved quickly and satisfactorily by the use of a mild direct stimulant to the stomach. *Capsicum*, ginger or peppermint, with or without the use of *eupatorium*, have often exercised a prompt and very satisfactory influence in cases of abrupt occurrence. I have obtained benefit from the action of an alkaline remedy continued for some little time, when such a remedy was indicated, and have been impressed with the necessity of eliminating the urates and other causes of autotoxemia. A saline laxative, which will act without irritation, is of benefit occasionally.

PALPITATION.

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lar movement, in which the force of the heart is usually temporarily increased, resulting in weakness, anxiety, difficult breathing, and accompanied in severe cases, with a cold sweat.

Etiology:—The causes of this condition are several; they may be extraneous in character, as from distention of the stomach with gas, thoracic effusions, or by the influence of rarefied air, as in mountain climbing. They may be reflex in character, induced by irritation or pain in any of the other organs or in the intestinal canal; or it may be induced by toxins, or from the excessive use of alcoholic liquors, and tobacco, or from tea and coffee; and also, from autointoxication. It may be due to disease either in the central nervous system, or of the sympathetic apparatus, or very rarely of the heart and arteries. Finally, it is quite common as the result of psychic conditions, as when induced by emotional causes, as distress, anxiety, or fear, or influenced by great sorrow; or by prolonged mental effort, resulting in acute nervous exhaustion. The condition is very common in patients who suffer from neurasthenia.

The mechanism of the heart is exceedingly complex. The intricate motor-apparatus promotes independent motion, but must receive accessions of force from the central nervous system. This nerve influence exercises an inhibiting power upon the heart, to preserve its action at a uniform rate, but the action of the organ is also influenced by certain properties within the blood vessels themselves; by the character and density of the blood; by the proper exercise of the respiratory function, involving or including oxygenation; and by the proper exercise of other important functions of animal life. So intimately is this mechanism concerned in the performance of all of the vital functions that any remote disturbances may readily influence the action of the heart.

Symptomatology:—Palpitation occurs, usually, with no premonitory symptoms. In the milder cases the patient is

at once conscious that there is sudden increased violence of the heart's action. This causes alarm, sometimes fear, and there may be precordial oppression, and some dull pain. Rarely, a slight pallor may overspread the countenance, although in most cases the face is flushed. It will be seen that the heart is slower than normal, and that the pulse beats are very full and large, although soft. In many cases there is but little disturbance of the rhythm. In other cases the irregularity of the beat is itself a distressing factor. These attacks occur without regularity, but those that depend upon disturbance of digestion will follow the taking of food, and those which occur from smoking, and the use of alcohol, will be apt to occur following any such excessive indulgence. The character of the beat will in no two cases be alike; it may be said that it is always tumultuous, and also accompanied with great discomfort and anxiety. Usually the patient must occupy a sitting posture, as it is impossible to lie down; soon he becomes weak and faint; there is dizziness and uncertainty of action; the pulse becomes weak, and as time passes, with no cessation of the difficulty, the feebleness increases and it becomes rapid and compressible. Usually, in the advanced stage of the difficulty, the rhythm is disturbed, and the heart is weak.

Auscultation shows no clear symptoms; the different heart sounds cannot be separately distinguished, because of the violence of the movement, and usually there are no valvular sounds apparent. The attack will cease in most cases as suddenly as it occurs; sometimes there will be only a few pulsations before the heart resumes its normal action; at other times the condition may last several hours; at still other times there may be a condition of palpitation, in which there are frequent irregular occurrences of the palpitation, with a complete intermission of a longer or shorter period, varying from half of a minute to four or five minutes. This state may last for several hours, or

even for a day or two, to finally abate by a gradual increase in the length of the intermissions.

However occurring, this condition results in temporary weakness, as it causes a shock of greater or less severity to the central nervous system. In the milder cases, the shock is too feeble to be appreciated. In severe cases, the patient may be several days in recovering from it.

Treatment:—A patient subject to attacks of palpitation should receive most careful attention from the physician. If the case is obscure, he should study every condition of that patient's system, until he determines the exact cause. A course of treatment must be laid out which will not only remove the cause, but will remove all factors that contribute to it. The patient must be assured with positiveness that there is no danger from the attacks, as death seldom, if ever, occurs during the period of palpitation, and relief from anxiety will contribute largely to the patient's immediate recovery. So common is the condition due to digestive faults—autotoxemia, and especially from the absorption of gases, which are the product of fermentation of food—that the first attention must be paid to the stomach and digestion. The so-called nervous dyspepsia is a very common cause of palpitation in neurasthenics. In these cases, the nervous system must be built up with the most positive nerve tonics and restoratives before the condition of the appetite will be greatly improved. The use of coffee, tea, and the ingestion of heavy meat diet with these patients must be proscribed and a vegetable diet substituted often, at least for a few weeks, and an active eliminative treatment adopted in order to rid the system of nitrogenous waste and other toxins. The patient must take an artificial digestive with all food, which must be selected with great care. Patients suffering from sorrow or mental distress, must be removed to an entirely new environment, and brought into contact with conditions, all of which are materially changed from the usual routine. A thorough cleansing of the intestinal tract is sometimes

necessary; and when tapeworm is the cause, as it occasionally is, this must be removed.

There are no specifics with which to immediately overcome an attack of palpitation. In severe and protracted cases, accompanied with pain, it may be necessary to administer a hypodermic of one-eighth of a grain of **morphin**. Usually, in extreme cases, ten drops of the **essence of peppermint**, with or without one-fourth of a dram of the **ginger**, given in hot water, will be sufficient. In other cases, a teaspoonful of the **sodium bicarbonate**, given in hot water, will produce immediate relief, especially if the evidences of gastric acidity are pronounced. Fifteen minims of specific **eupatorium**, repeated every half hour, will be of benefit. In others, an infusion of **capsicum** will relieve the condition. At times the external application of fifteen minims of **chloroform** in the palm of the hand, held firmly over the heart, until severe burning is produced, will result in immediate benefit. Where the symptoms are alarming, and there is extreme pallor, an inhalation of **amyl nitrate** will be sufficient. In others, **glonoin**, in granules of the one-two-hundredth of a grain each, every fifteen minutes, until four or five are taken, will be sufficient. Some physicians advise swallowing small fragments of ice, or an application of ice over the heart. Others will apply heat to the chest, and advise the patient to drink hot drinks; it is not advisable, however, to distend the stomach with fluids. The palpitation will cease more readily if the stomach be empty. Counter-irritation, or an application of cold over the sympathetic ganglia of the spinal cord, will sometimes give immediate relief. This may be accomplished with the chloroform application above described, or other available measures.

ANGINA PECTORIS.

Synonyms:—Neuralgia of the heart; stenocardia; breast-pang.

Definition:—An acute paroxysmal pain in the heart and

throughout the præcordial region, radiating into the left shoulder and arm, characterized by a sense of impending dissolution, agonizing fear and great prostration.

Etiology:—While the condition is a neurosis, it is dependent upon disease in the heart of some character, although the evidences at first may not be pronounced. It may be hereditarily transmitted, though this is questioned, or it may be acquired. If hereditary or of purely nervous origin, it may occur at any age; if acquired it is more apt to occur in middle or advanced life, as the conditions which induce it are usually chronic in character and of slow development. It is somewhat more frequent in males than in females. Trousseau referred to it as a masked epilepsy. The attacks may alternate with epileptic seizures in epileptics, may precede an outbreak of insanity and will accompany hysterical paroxysms.

It occurs with fatty degeneration of the heart and with diseases which affect the coronary arteries or impede the circulation in those arteries. It accompanies atheroma or arterio-sclerosis.

It is more common in neurotic individuals and is induced by the use of cigarettes and by tobacco in any form and by alcoholic intemperance. It accompanies Bright's disease and rheumatism and gout, either directly or as a result of the heart mischief these conditions induce.

Symptomatology:—The immediate symptom is the **agonizing pain** in the heart, which occurs unannounced, and in irregular paroxysms. In the intervals between the paroxysms there are no symptoms. There are no premonitory evidences of the approach of the pain. It may occur when the patient is in good health, or there may be other disease present of a more or less exhausting character. It may occur after physical exercise or during a period of mental excitement, or it may occur while the patient is quiet or during sleep. There is a sense of immediate **suffocation**, intense alarm and indescribable distress throughout the præcordial region.

The patient braces himself in a fixed position as if he feared to move; the eyes become set and staring; the countenance assumes an expression of anguish and terror combined; a deathly **pallor** overspreads the countenance and he breaks out in a cold sweat, in some cases a dripping sweat, and the teeth chatter as if the patient were in a severe chill. The attack may last but a few seconds or it may continue several minutes. The patient may faint during the paroxysm and die from syncope, or he may suffer from extreme vertigo and disordered vision for the moment, to soon recover when the pain has ceased. The respiration is not necessarily influenced by the pain, although it may be greatly oppressed. The heart usually beats irregularly with greatly increased power at first, but soon the pulse becomes small, hard and frequent, finally rapid and feeble. The heart may intermit or beat with great irregularity, both in time and rhythm.

The recovery of the patient is quite rapid, although there is often immediate prostration. The attack may be followed with vomiting, eructation of gas, occasionally a loose bowel movement with colicky pains, and the passage of a large quantity of pale urine of a high specific gravity.

The paroxysms will recur after a longer or shorter period, usually with increasing severity. There may be only a few days between them, but usually several months or even a year may intervene.

Prognosis:—It is seldom that the patient survives a third attack. This is especially true if the disease is accompanied by a serious heart lesion. It is rare that death occurs in the first paroxysm. The prognosis in all cases is bad.

Treatment:—While there is but little premonition of a typical attack of agina, there are symptoms which are sufficiently plain to enable a physician to prescribe with the object of preventing the attack, the use of **nitroglycerin** and **amyl nitrite** are the most available measures for an immediate influence, the use of a hypodermic of **morphin** or the application of **chloroform** over the heart and over the

spinal cord in the cervical region at the same time will sometimes prevent an attack. Half of a dram of chloroform, in the palms of the hands, applied one over the heart and one over the spinal column should be pressed closely against the skin until an intense burning sensation is induced. The use of full doses of **gelsemium** and **macrotys** will prevent or abridge an attack. During the pain five drops of the amyl nitrite, inhaled directly from pearls crushed on a handkerchief, will prove satisfactory.

The treatment between the paroxysms of existing conditions will depend upon the cause, which must be determined by a most careful examination, and this alone may receive treatment without reference to the possible later occurrence of the angina. Where nervous excitement results in irritation or vice versa, nerve sedatives should be used with reference to the removal of any possible irritation. If there is feebleness the sedative must be of the stimulating type, as the **ammonium valerianate** or the **ammonium bromid**, Constitutional conditions and the condition of the stomach and appropriative organs must have careful attention.

TACHYCARDIA.

Synonyms:—Synchopexia; rapid heart; *tachycardia paroxysmalis*.

Definition:—A condition of rapid heart action due either to paralysis of the vaso-motor nerves, which results in deficient control of the motor apparatus, through imperfect action of the vagus, or, to undue stimulation of the sympathetic, which results in exalted or increased nerve influence and consequent violent action.

Etiology:—The condition occurs independently of organic disease of the heart. It is functional in character, and usually reflex in its origin, following those conditions which irritate the nervous system, and which induce palpitation; chronic indigestion, or taking of too large a quantity of nitrogenous food, or use of tea, coffee and tobacco. It is not uncommon to hysterical women, and

will occur as a result of extreme grief, or fright, anger, or other cause of agitation, and from protracted muscular exercise. Irritation of the genito-urinary organs or reproductive system are common causes, as it is apt to occur at the menopause, or in either sex, from masturbation. Disease of the medulla, or spinal cord, tumors, aneurisms, or other serious chronic lesions may exercise an exciting influence.

Symptomatology:—While the condition may be paroxysmal, and occur suddenly, similar to attacks of palpitation, it is much more apt to develop somewhat gradually, not being observed until the heart is beating regularly at from one hundred to perhaps one hundred and twenty pulsations per minute. In typical cases there are no intermissions, or remissions, for days at a time; often running into weeks, with no cessation of the regular rapid beating. There may be no pain, but a general precordial distress, or sense of oppression in the chest and an inclination to press upon the chest, or to hold it with the hands. There is increased weakness, with trembling of the limbs, and, perhaps, ultimate prostration. Sooner or later, vertigo occurs with some nausea and perhaps vomiting, tinnitus aureum and some disturbances of vision. The patient at first is anxious and soon becomes restless and greatly disturbed over the condition; in severe cases there is a sense of impending dissolution and fear, with much pallor. In paroxysmal cases the pulse is apt to be more rapid than in the form above described. In these it may begin with a pulse rate of one hundred and fifty beats per minute, increased later to, perhaps, two hundred or more. The oppression of the chest induces difficult breathing, and there may be some cyanosis, although pallor is not uncommon. Patients suffering from anemia or chlorosis are more liable to attacks of the paroxysmal form of the disease. In those cases resulting from overstimulation of the sympathetic, the pulse is small, hard, and inclined to be wiry and steadily rapid. In cases where paralysis of the vagus is the

cause the pulse is small, easily compressible, rapid, and often very feeble, many times scarcely distinguishable. This condition is not necessarily accompanied with palpitation. It is often the case that the patient will describe a sensation of slowness of the heart action in tachycardia while by actual count it may be beating two hundred beats per minute.

Prognosis:—The condition is not necessarily a serious one. It may disappear spontaneously when the cause of its occurrence is removed, with no permanent impairment of the health or changes in the heart structure. In other cases, where the cause is not well defined, or remains undiscovered, the condition may last for several years. Death occurs from complications.

Treatment:—General attention to those conditions which induce tachycardia must be conducted in like manner to that suggested for palpitation. The two conditions, however, must, in direct treatment, have careful consideration. Those resulting from paralysis and deficient nerve action must be treated with stimulants and tonics; while those induced by sthenia, by undue stimulation, or exalted nerve action, must be treated by sedatives. I treated at one time a case of tachycardia in a hysterical young woman, in otherwise excellent health, strong, active and vigorous, in which the regular uniform pulsation at one hundred and forty beats per minute continued for eighteen months, and did not materially interfere with her daily occupation. In prescribing cactus for this case, it exercised its characteristic tonic and stimulating action and it thus increased the condition, although the dose given was small. It became necessary to put the patient upon gelsemium, an active nerve sedative, and the bromids. This class of patients will stand aconite and veratrum in physiological doses for protracted periods, if the appetite and digestion remain undisturbed. I have a case under observation at the present time in which there is exaltation of nerve force, the patient being strong and vigorous, in which this class of

remedies is prescribed with satisfactory results. Where there is deficiency of nerve force that class of heart remedies which increase the strength of the nervous system and improve its nutrition must be selected. This class of cases will stand some stimulation also. Cactus will work nicely here, and small doses of nux vomica, or the strychnin arsenate, in frequently repeated doses of about $1/134$ of a grain may be given. Those measures suggested for palpitation, with weakness, are applicable in this case and need not be reiterated in detail.

BRADYCARDIA.

Synonym:—Brachycardia.

Definition:—A condition of the action of the heart in which the pulsation is much slower than normal, although usually regular and uniform in rhyme and rhythm. In extreme cases the pulse may be slowed to twenty-four beats per minute. I have known of several cases in strong men where the usual beat was forty-six per minute, or below. This may result from conditions which are entirely the opposite of those which induce tachycardia, or in extreme cases the two conditions may be due to similar causes. They are apt to occur following protracted fevers and acute exhausting disease. Conditions that result in uniform weakness of the entire system, may induce it. It may also be caused by any influence that will cause and maintain an undue rise in arterial pressure. It results from the physiological action of opium, from lead poison, and from poisonous alkaloids, which act as motor depressants. It is a normal condition following labor. Diseases which may be followed by slow pulse are apoplexy, with resulting paralyzes, meningitis, cerebral tumors, syphilis, myxedema, and chronic asthma and emphysema. It occurs as a result of disease of the coronary arteries, in fatty degeneration of the myocardium, and, occasionally, in aortic stenosis. It occurs in insane patients also, and in melancholia.

Symptomatology:—When the condition occurs in par-

oxysms, the onset is sudden, but in most cases the condition is one of gradual development and gradual termination. Usually but few symptoms appear in protracted cases, the patient's habits will be observed to be sluggish, with mental inactivity, and there may be some difficulty of breathing, which is increased upon violent action, but few other symptoms are observed unless there is vertigo, or occasionally, attacks of unconsciousness. In paroxysms, the onset may be marked by extreme vertigo, with syncope, unconsciousness, continuing for a varying length of time, with sluggishness of every function of the body, which does not readily respond to stimulation. The pulse varies from the slow, round, full beat, of perhaps from forty to twelve beats per minute, to a small, weak, easily compressible pulse, which will beat from sixty to forty beats per minute. The action of the heart, while slow and regular, may be greatly increased in force, the contractions being much more violent than normal; and yet the pulse wave may not be perceptible at the wrist, and the heart sounds will be feeble.

Treatment:—The patient must be removed from all conditions which may cause a violent impression to be made upon the nervous system; must be placed in a condition of rest and extreme quietude. Attention to the functional operation of the various organs of the body must be the same as those advised for other serious heart disorders; at the same time, the nervous system must be subject to the influence of the most potent restorative tonics. Stimulants given for their immediate influence must be administered with great care. Where the temperature has fallen with the reduced pulse beat, I have obtained excellent results from an alteration of **cactus** and **strychnin**, both in small doses. **Hydrastis**, **collinsonia**, small doses of **nitroglycerin**, and well selected stimulating tonics may be administered. No specific measures are as yet available.

Diseases of the Arteries.

It would be impossible for the heart and contiguous organs to be affected with structural disease without the same pathological conditions affecting the arteries themselves to a degree. These tubes are subject to the influence of increased tension, and of high temperatures, and also to irritant poisons circulating in the blood, which may be bacterial or toxins resulting from bacteria. Or they may be influenced by the presence of an excess of the normal salts in the blood. An inflammation of the arteries may occur, or there may be fatty degeneration or calcification or amyloid degeneration, which is rare. The circulation in the vessels may be impeded by thrombi or by emboli, which may result in necrosis with consequent absorption of septic material in cases of infective origin.

Among the most common of the inflammatory conditions is inflammation of the aorta, which is apt to occur during infectious disease, and also as the result of the use of alcohol. When disease of the coronary arteries occurs there is apt to be a blocking of the branches and a consequent supuration, which is described as a circumscribed myocarditis. These vessels are quite commonly influenced by the presence of syphilis, which may produce important changes in their structure.

The treatment of disease of the arteries is general in character, and must be directed to the underlying cause.

ARTERIOSCLEROSIS.

Synonyms:—Atheroma; arterial sclerosis; endarteritis; arterio-capillary fibrosis.

Definition:—A condition of increased growth—overgrowth—of the connective tissue, first, of the arterioles, and second, of the larger vessels, into which calcareous matter is ultimately deposited. The condition is more common in the aged and in those who have been intemperate and have led a life of general dissipation; also those who suffer from lead poisoning or from chronic interstitial nephritis. The condition involves, first, the aorta, then the coronary arteries and subsequently the arteries of the brain, and then those of the extremities. The mesenteric arteries and the arteries of the stomach and liver are seldom affected.

Symptomatology:—One of the early apparent symptoms is a displacement of the apex beat of the heart, which will be found to be displaced downward and to the left, with an increased force in the impulse. Other symptoms may not be apparent until the disease has been present for perhaps a number of years. If the affected artery is somewhat superficial, so that it can be felt, it will be found to be structurally hard and incompressible. As the disease progresses the pulse wave is influenced until ultimately it can scarcely be felt. This is due to the loss of elasticity in the walls of the vessels. This condition directly influences the heart, increasing its work and thus inducing hypertrophy of the left ventricle as a common sequel. This may become sufficiently exaggerated to completely mask the evidences of arteriosclerosis. There will be farther a sensation of precordial constriction with some pain and perhaps a subsequent development of angina pectoris. Palpitation on any exertion, with difficult breathing, are not uncommon.

When the condition affects the cerebral arteries, there is syncope, vertigo, persistent and intractable headaches, tinnitus aurium and subsequently local paresis. The condi-

tion of these arteries renders them especially liable to rupture, with the consequent result of apoplexy and paralysis.

Treatment:—Remedies that will lower the blood-tension and decrease the force of the heart's action will tend to ameliorate the symptoms of this disorder. Troublesome symptoms depending upon it will be allayed also by heart sedatives carefully selected. When the vessels of the brain are not affected and there are no evidences of cerebral fulness, **nitroglycerin** will be beneficial often, but if there is a tendency toward cerebral hyperemia and vertigo or tinnitus aureum are present, this remedy must be avoided. It is wise to change the patient's habits of life and to subject him to conditions which are unusual but in every way agreeable. Changes in the diet exercise a most marked influence upon the condition and retard the appearance of any serious symptom. There is a consensus of opinion among writers in favor of the use of the **potassium** or **sodium iodid** in this condition. It is thought that they retard the deposits and tend to restore a normal condition of the arterial walls. The use of alcohol must be strictly prohibited and stimulating condiments with the food. The patient must be kept from active muscular effort, from anxiety, despondency or worry and from anger, and must reside in a low altitude.

ANEURISM.

Definition:—A tumor caused by a localized dilatation of a blood-vessel. It may involve an artery, a vein or both conjointly.

There are three varieties of aneurism. They are the **fusiform**, in which the portion of the blood-vessel involved is evenly dilated, and the **sacculated**, in which an area not including the whole circumference of the blood-vessel is dilated. A sacculated aneurism may be found upon a portion of a fusiform aneurism. The third variety is the **dissecting** aneurism, in which the blood has dissected its way between the coats of the blood-vessel.

Occurrence:—The order in frequency of occurrence is as follows: Thoracic aorta, ascending and transverse portions, popliteal, carotid, subclavian, innominate, axillary, abdominal aorta. Small arteries are also involved, those in the brain, lungs and heart giving rise to serious conditions.

Etiology:—Aneurisms occur most frequently in the active period of life when the vascular system begins to be weakened and while yet the full tide of life's activities is on. Strain, both physical and emotional, are consequently factors in the etiology of aneurism. Men are more frequently affected than women. Anything that weakens the wall of the blood-vessel may cause aneurism, and syphilis, alcohol, rheumatism and gout are therefore responsible for many cases. Parasitic embolism may give rise to aneurism and trauma may be followed by it.

Symptomatology:—Twenty per cent of aneurisms give rise to no symptoms. Inspection may reveal a tumor, which may be seen to pulsate. Palpation may confirm these findings. The pulsations will be found to be synchronous with the heart-beats. If possible to apply both hands to the tumor they will tend to separate with each pulsation. If pressure is applied to the artery on the side of the tumor proximal to the heart the size of the tumor is lessened. If pressure is applied to the artery on the side of the tumor distal to the heart the size of the tumor is increased. Auscultation will reveal a bruit in the tumor and in the artery beyond it in the majority of cases. Percussion in thoracic and abdominal aneurisms may reveal an increased area of dulness according to the size and location of the tumor.

Pain is a common and early symptom of aneurism, and is due to pressure on nerves. It is especially severe when the tumor erodes bone as the vertebral bodies in the case of thoracic or abdominal aneurism.

There are certain signs and symptoms of aneurism dependent on the size and location of the tumor. In the

extremities œdema and gangrene occur, the former constantly after the aneurism has reached a certain size. Aneurism of the vessels of the brain may cause hemiplegia, facial paralysis, blindness, ptosis, strabismus, and deafness by pressure on the cranial nerves.

In the thorax the tumor may compress the œsophagus, causing dysphagia; the trachea, causing the symptom known as tracheal tugging; the thoracic duct, interfering with nutrition; the recurrent laryngeal nerve, causing a characteristic and persistent brassy cough; the phrenic nerve, causing hiccough; the sympathetic ganglia, causing capillary congestion; with pressure on the left common carotid or the innominate, the radial pulse of the side affected will be delayed.

Aneurism of the abdominal aorta may cause pain by eroding the vertebræ; subsequently numbness and tingling in the legs may develop. Paraplegia may be the ultimate consequence.

Disorders of digestion, especially vomiting and pain, are usual. In the epigastric region a distinct tumor is generally visible and palpable. Pulsation of the abdominal aorta must not be mistaken for aneurism. A systolic murmur is usually heard, frequently best elicited behind, near the spinal column.

Diagnosis:—Aneurisms, visible or palpable, are differentiated from other pulsating tumors by being expansile in the majority of cases. The factors of pain and functional disturbance must be considered in relation to other symptoms and usually a diagnosis of aneurism may be arrived at. Rheumatism is sometimes simulated by popliteal aneurisms, and girdle pains of tabes dorsalis by pressure of an abdominal aneurism on the spinal nerves near the intervertebral foramina. The pain of aneurism is more constant and not so variable in intensity. Tumors of the mediastinum usually produce more severe symptoms, as tracheal stenosis rather than tugging, and recurrent laryngeal pa-

ralysis as compared to irritation as seen in the brassy cough.

Treatment:—The first essential in the treatment is rest; absolute physical rest, retaining a passive condition of the muscular system as long as possible, at times without any exercise, or even movement. At the same time mental quiet must be maintained and an entire absence of mental exercise, if possible, as well as avoidance of excitement, agitation, worry, anger or grief. All this is done to preserve the least possible muscular effort on the part of the heart, in maintaining the circulation and to slow its action and lessen its force. The main object of the medical treatment is to solidify the contents of the sac through coagulation of the blood and solidification of its fibrin. The old school of physicians accomplished these results by depletion and restriction of the diet.

The use of **veratrum viride** to slow and steady the heart's action is authorized, with **gelsemium** to reduce nerve tension, arterial tonus and nerve irritation. The **bromids** will accomplish the same results and lessen muscular irritability when that exists. The potassium bromid is the best for this purpose if there is no undue sensitiveness or irritation of the stomach. **Aconite** is an important remedy at this time in its influence upon the entire circulatory apparatus. The **potassium iodid** has the confidence of the profession in its influence upon the major portion of the conditions involved. It lessens pain, diminishes both the tension of the sac and general arterial tonus and increases the contractile power of the muscular structures which is usually lessened. The influence of the remedy in syphilitics is universally recognized.

Ergot is of some service. We would use it in small doses, in conjunction with similar doses of **hydrastin**, giving this latter agent short of any active tonic or stimulating influence it might exercise.

The **electrical method** of consolidation is now employed in sacculated aneurism. From five to ten or more feet of

fine gold wire, thoroughly sterilized, are introduced into the sac through an insulated needle. The external end of the wire is attached to the positive electrode of a galvanic battery and the negative electrode is applied to the back, and from five to fifteen milliamperes of electricity are turned on. The current is allowed to pass through the wire from half an hour to an hour. The wire is then clipped close to the wall of the sac, and the tip is caused to be withdrawn within the sac. This, followed by absolute quiet, results in speedy and quite satisfactory consolidation. The condition of the walls, however, may be such that other sacs will quickly form.

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ON
Materia Medica and Therapeutics

WITH REFERENCE TO THE
SPECIFIC ACTION OF DRUGS

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